

A critical review of the genus *Heliophanus* C.L. Koch, 1833, of Middle Asia and the Caucasus (Aranei Salticidae)

Критический обзор рода *Heliophanus* C.L. Koch, 1833 Средней Азии и Кавказа (Aranei Salticidae)

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KEY WORDS: jumping spiders, fauna, taxonomy, Middle Asia, the Caucasus.

КЛЮЧЕВЫЕ СЛОВА: пауки-скакуны, фауна, систематика, Средняя Азия, Кавказ.

ABSTRACT: The paper presents a revision of the genus *Heliophanus* in the faunas of the Caucasus and Middle Asia. Sixteen species are described and figured, including two new to science: *H. dunini* sp.n. and *H. wesolowskiae* sp.n. Distributional maps for each species are provided as well. The lectotype of *H. turanicus* Kharitonov, 1969, is designated for the first time. *H. ignorabilis* Wesolowska, 1986, is recognized to be a junior synonym of *H. verus* Wesolowska, 1986, rather than of *H. mordax* (O.P.-Cambridge, 1872), as it was supposed earlier. Females of *H. forcipifer* Kulczyński, 1895, and *H. verus* are described for the first time.

Seven species have been excluded from the species lists of the Caucasian and Middle Asian *Heliophanus*: *H. aeneus* (Hahn, 1831), *H. melinus* L. Koch, 1867, *H. minutissimus* Simon, 1871, *H. niveiventis* Simon, 1889, *H. rufithorax* Simon, 1868, *H. simplex* Simon, 1868, and *H. tribulosus* Simon, 1868.

РЕЗЮМЕ: Статья представляет собой ревизию рода *Heliophanus* в фаунах Кавказа и Средней Азии. Описаны и изображены 16 видов, в т.ч. два, новые для науки: *H. dunini* sp.n. и *H. wesolowskiae* sp.n. Для каждого вида даны также карты распространения. Впервые выделен лекотип для *H. turanicus* Kharitonov, 1969. Выяснено, что *H. ignorabilis* Wesolowska, 1986 является младшим синонимом *H. verus* Wesolowska, 1986, а не *H. mordax* (O.P.-Cambridge, 1872), как предполагали ранее. Впервые описаны самки *H. forcipifer* Kulczyński, 1895 и *H. verus*. Семь видов исключены из списков кавказских и среднеазиатских видов

рода: *H. aeneus* (Hahn, 1831), *H. melinus* L. Koch, 1867, *H. minutissimus* Simon, 1871, *H. niveiventis* Simon, 1889, *H. rufithorax* Simon, 1868, *H. simplex* Simon, 1868 и *H. tribulosus* Simon, 1868.

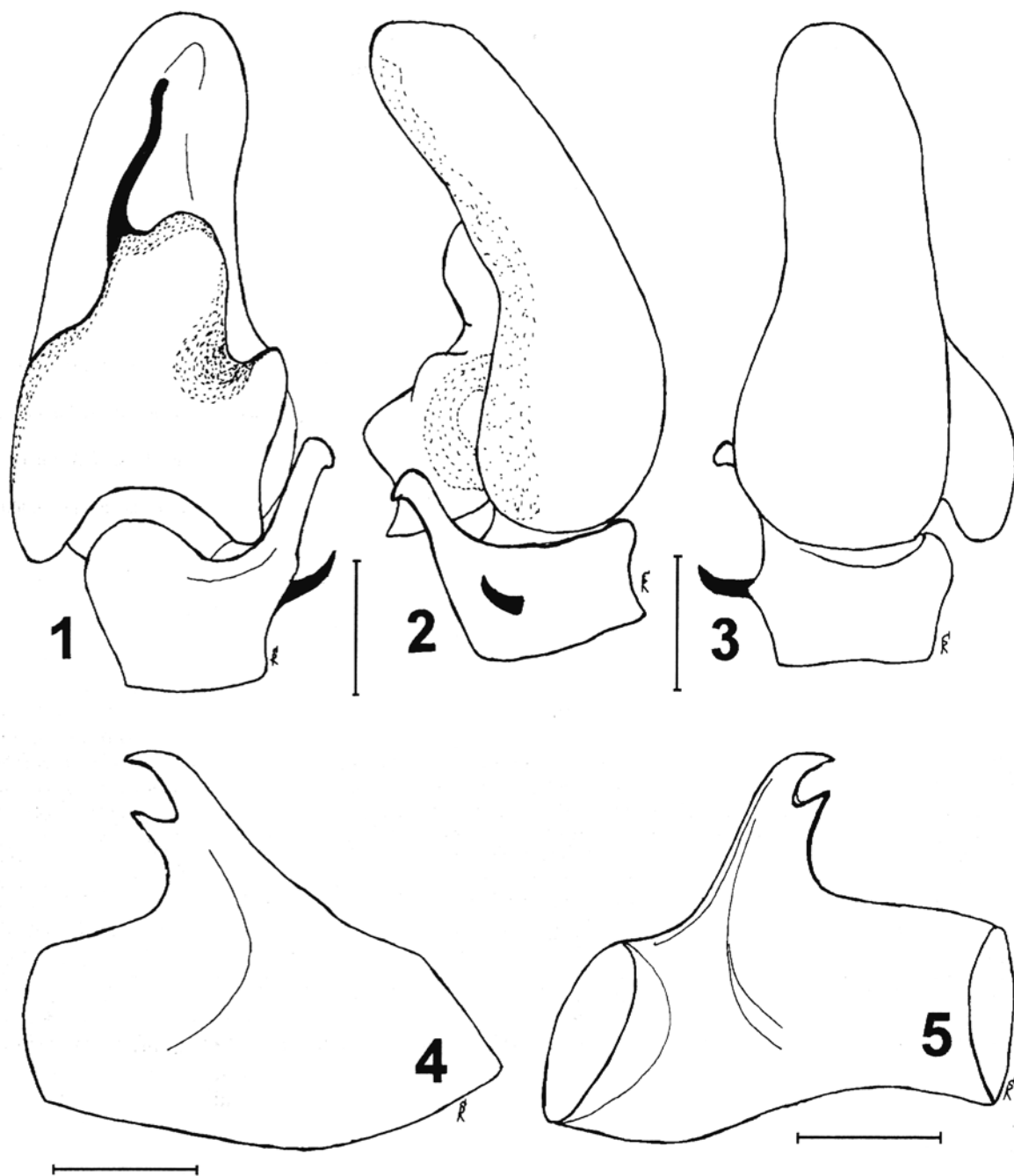
Introduction

To the moment, about 125 valid species have been described in the spider genus *Heliophanus* [see Prószyński, 1990], of which 22 have hitherto been reported in the faunas of the Caucasus and Middle Asia [Nenilin, 1984a, 1985]. Seven of these records are here recognized as either erroneous or requiring confirmation upon pertinent material (see below). According to the current data, 16 valid species occur in the areas under study, all of them being treated below.

Material and methods

The work is based on museum collections and material newly taken from the Caucasus and Middle Asia. A total of 849 specimens of *Heliophanus* have been (re-)examined.

Specimens for this study have been borrowed from or housed in the following museums: HMNH — the Hungarian Museum of Natural History, Budapest, Hungary; ISE — the Zoological Museum of the Institute for Systematics and Ecology of Animals, Novosibirsk, Russia; PSU — the Zoological Department of the Perm State University, Perm, Russia; SVO — personal collection of Mr. S.V. Ovtchinnikov, Bishkek, Kyrgyzstan; ZISP —



Figs 1-5. *Heliophanus auratus* (C. L. Koch, 1835): 1 — ♂ palp, ventral view; 2 — ditto, lateral view; 3 — ditto, dorsal view; 4 — palpal femur, lateral view; 5 — ditto, median view. Scale: 0.14 mm.

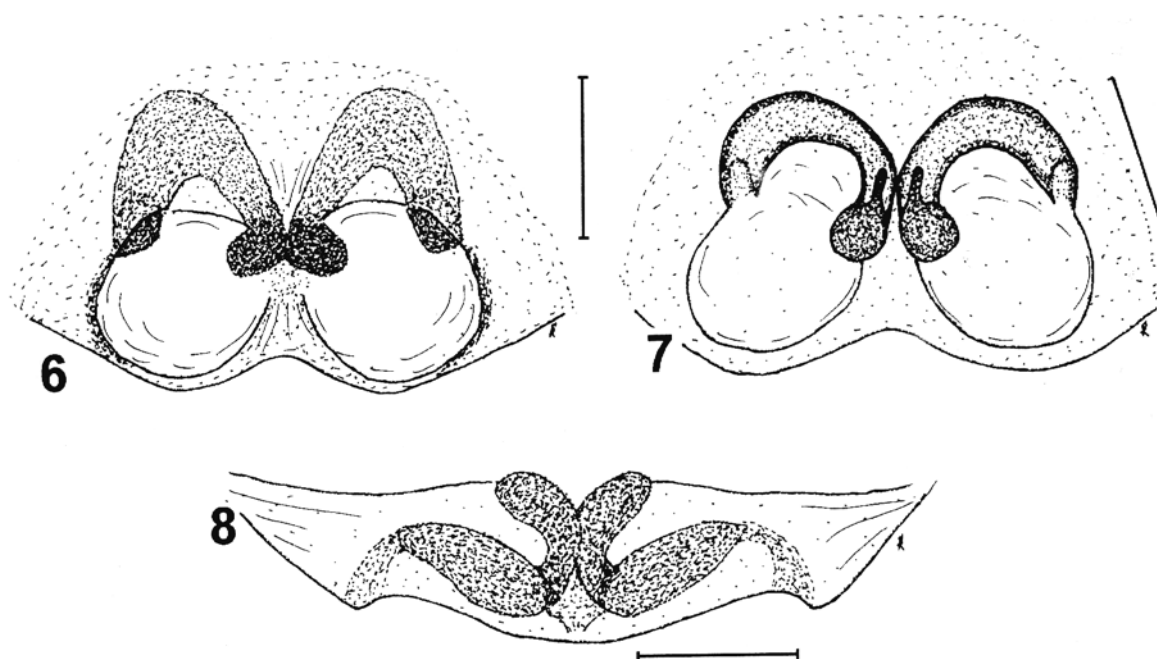
Рис. 1-5. *Heliophanus auratus* (C. L. Koch, 1835): 1 — палепа ♂, вентрально; 2 — то же, латерально; 3 — то же, дорсально; 4 — бедро палепы, латерально; 5 — то же, медиально. Масштаб: 0,14 мм.

the Zoological Institute of the Russian Academy of Science, St. Petersburg, Russia; ZMMU — the Zoological Museum of the Moscow State University, Moscow, Russia.

Since this paper is a regional review, not a complete revision, of the genus *Heliophanus*, relevant literature for each species mentioned includes only the sources concerning the spider fauna of the

territories under study. For a complete list of taxonomic work on this genus, see Harm [1971], Wesolowska [1986] and Prószyński [1990].

In most cases, the names of collectors are abbreviated as follows: Dr. V.V. Dubatolov (V.D.), Dr. P.M. Dunin (P.D.), Dr. D.V. Logunov (D.L.), Mr. O.V. Lyakhov (O.L.), Mr. D.A. Milko (D.M.), Dr. V.I. Ovtsharenko, Mr. S.V. Ovtchinnikov



Figs 6-8. *Heliophanus auratus* (C. L. Koch, 1835): 6 — epigyne; 7 — spermathecae, dorsal view; 8 — ditto, rear view. Scale: 0.14 mm.

Рис. 6-8. *Heliophanus auratus* (C. L. Koch, 1835): 6 — эпигина; 7 — сперматека; 8 — то же, вид сзади. Масштаб: 0,14 мм.

(S.O.), Dr. S.L. Zonshtein (S.Z.), Dr. A.A. Zyuzin (A.Z.).

Abbreviations used in the figures and text are as follows: ap. — apically; d. — dorsally; Fm — femur; Mt — metatarsus; pr. — prolaterally; Pt — patella; rt. — retrolaterally; Tb — tibia; v. — ventrally. For leg spination, the system adopted is that used by Ono [1988]. The sequence of leg segments in measurement data is the following: femur + patella + tibia + metatarsus + tarsus. All measurements are in mm.

Heliophanus C.L. Koch, 1833

Generic synonymy: See Wesołowska [1986: 5].

Type species: *Salticus aeneus* Hahn, 1831, by subsequent designation [Simon, 1901].

Remarks. The definition and diagnosis of the genus *Heliophanus* have been adequately given by Harm [1971] and Wesołowska [1986].

Survey of species

Heliophanus auratus C.L. Koch, 1835 Figs 1-9.

H. auratus: Nenilin, 1984a: 17; 1984b: 136; 1985: 130; Savelieva, 1990: 173; Mikhailov & Fet, 1994: 517; Zonshtein, 1984: 148; Dunin, 1979: 38; 1984: 58; 1989: 38; Dunin & Mamedov, 1992: 57; Prószyński, 1979: 308; Minoranskii et al., 1984: 77.

H. nigriceps: Kulczyński, 1895: 6; Spassky & Shnitnikov, 1937: 294.

Material. KRASNODAR PROVINCE: 1 ♂ (ZMMU),

Elisavetskoye, 27.08.1982, E. Prokofyeva. — AZERBAIJAN: 2 ♀♀ (ZISP), Lenkoran, Hyrcan Reserve, 20-21.06.1985, P.D.; 1 ♂ (ZISP), Khachmas, 22.09.1986, P.D.; 7 ♀♀ (ISE), Nakhichevan, Shakhbuz Distr., Bichenek, 1900 m alt., 13.07.1988, P.D.; 1 ♂, 1 ♀ (ISE), Saatly, Dzhafarkhan, 22-29.06.1982, A. Mamedov; 2 ♀♀ (ISE), same locality, 30.05.1978, P.D. — ARMENIA: 1 ♀ (ISE), Town Sevan, 31.07.1983, D.L.; 1 ♂ (ZISP), Megri Distr., Niuvari, 25.04.1983, V. Yanushev. — KAZAKHSTAN: 2 ♀♀ (ISE), "Shazyn riverside", 43°35'N, 79°18'E, 13.06.1993, D.M.; 2 ♂♂, 2 ♀♀ (ZMMU), 2 ♂♂, 3 ♀♀ (ISE), environs of Pavlodar, Irtysh River Valley, 20.06.1994, O.L.; 4 ♀♀ (ISE), Pavlodar Area, Mayskoe Distr., Lake Koktas, 8.05.1990, O.L.; 1 ♂ (ISE), same area, Bayanaul Distr., Kyzyl-Tau, 12.06.1991, O.L.; 1 ♂, 2 ♀♀ (ISE), 20 km S of Pavlodar, Zarya, 17.06.1992, O.L.; 1 ♂ (ZISP), Akmolinsk, Lake Kurchaldzhyno, 06.1929, S. Spassky; 2 ♀♀ (ZISP), Semirechie, S. Spassky's Collection. — KYRGYZSTAN: 1 ♂ (ZISP), Kirghizskii Mt. Range, Taty, 25.06.1986, S.O.; 1 ♂ (ISE), Sary-Chelek Reserve, 28.05.1993, D.M.; 1 ♀ (ISE), Lake Issyk-Kul, Chon-Uryukty River, 1700-2500 m alt., 24.06.1993, D.M.; 1 ♀ (ZMMU), same locality, Cholpon-Ata, 15.06.1978, S.Z.; 1 ♀ (ISE), Dzhanghi-Pakhta, 10.06.1986, S.O.; 1 ♂ (ISE), Kamyshevka, Chu River, 40 km NNW of Bishkek, 7.05.1985, S.O. — TAJIKISTAN: 1 ♂ (ISE), Dushanbe, 12.07.1991, S.O. — UNCERTAIN LOCALITIES: 1 ♀ (ISE), Bymburovo (?), 17.08-6.09.1991, coll. ?

Diagnosis. The ♀ of *H. auratus* is close to that of *H. potanini* (see comments in "Diagnosis" under *H. potanini*), while the ♂ is similar to that of *H. flavipes*, *H. aeneus* Hahn, 1831, and *H. melinus* L. Koch, 1867. From *H. flavipes*, the ♂ differs in the place of origin of the embolus as well as by the shape of the tegulum (cf. Figs 1 and 67), from *H. aeneus* by the presence of a bifurcated femoral process [cf. Wesołowska, 1986: fig. 612], and from *H. melinus* by both the structure of the femoral process of the palp and the dorsal abdominal coloration (*H. auratus* lacks a pair of longitudinal stripes) [cf. Wesołowska, 1986: figs 741-747].

Distribution. This Euro-Siberian species has been described from Armenia as *H. nigriceps* [Kulczyński,

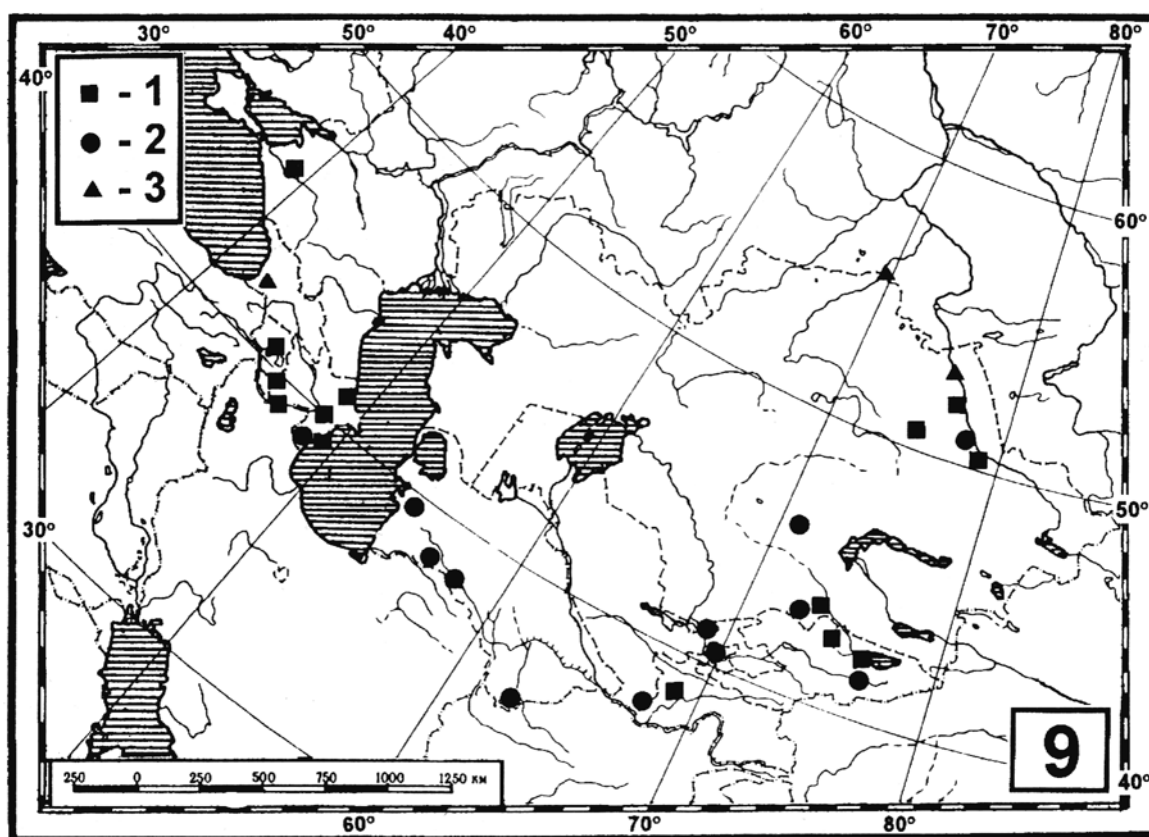


Fig. 9. Localities of *H. auratus* (1), *H. curvidens* (2) and *H. dubius* (3) in the Caucasus and in Middle Asia.
Рис. 9. Местонахождения *H. auratus* (1), *H. curvidens* (2) и *H. dubius* (3) на Кавказе и в Средней Азии.

1895] and then reported under this name from both the Caucasus: Khosta [Spassky, 1937], and Middle Asia [Spassky & Shnitnikov, 1937]. Later, *H. auratus* was reported from Kyrgyzstan: Cholpon-Ata, Ferganskii and Chatkalskii mt. ranges [Nenilin, 1984b; Zonshtein, 1984]; E- and S-Kazakhstan: Almaty, Tarbagatai [Spassky & Shnitnikov, 1937; Prószyński, 1979; Tarabaev, 1979; Nenilin, 1984a; Savlieva, 1970, 1976, 1979, 1990]; Turkmenistan: Murgab [Prószyński, 1979; Nenilin, 1984a; Mikhailov & Fet, 1994]; Uzbekistan: Urgut, Samarkand, Tashkent [Kroneberg, 1875; Nenilin, 1984a]; Azerbaijan [Dunin, 1979, 1984, 1989; Dunin & Mamedov, 1992]; and Chechnya [Minoranskii et al., 1984; Minoranskii, 1988]. All localities of *H. auratus* in Middle Asia and in the Caucasus are shown in Fig. 9.

Description. MALE. Measurements. Carapace 2.25 long, 1.50 wide, 0.75 high at PLE. Ocular area 0.08 long, 1.20 wide anteriorly and 1.35 wide posteriorly. Diameter of AME 0.38. Abdomen 2.25 long, 1.50 wide. Cheliceral length 0.75. Length of leg segments: leg I: $1.25 + 0.75 + 0.87 + 0.62 + 0.58$; leg II: $1.00 + 0.50 + 0.75 + 0.58 + 0.50$; leg III: $1.13 + 0.50 + 0.62 + 0.78 + 0.60$; leg IV: $1.38 + 0.58 + 0.87 + 0.73 + 0.62$. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.2-2; Mt v.2-2. Leg II: Fm d.1-1-1; pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.1-2-2ap., pr. and rt.1ap., v.1-2ap. Coloration typical for *Heliophanus*. Abdomen grey, dorsum covered with white hairs anteri-

orly. Legs orange with brownish femora, with femora I being darkest. Palpal structure as in Figs 1-5.

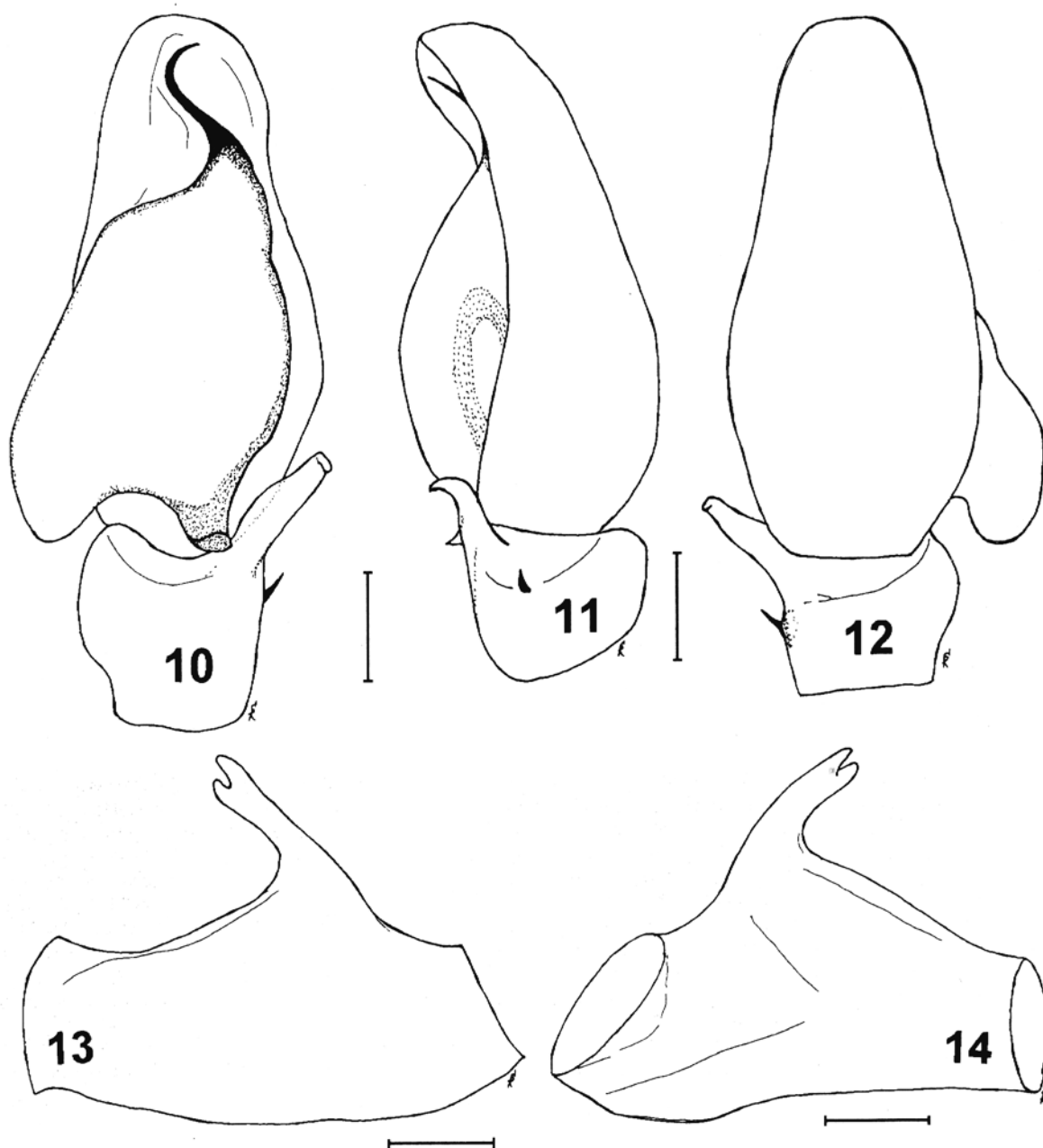
FEMALE. Measurements. Carapace 2.25 long, 1.45 wide, 1.00 high at PLE. Ocular area 0.85 long, 1.20 wide anteriorly and 1.25 wide posteriorly. Diameter of AME 0.38. Abdomen 3.50 long, 2.15 wide. Cheliceral length 0.65. Length of leg segments: leg I: $1.00 + 0.60 + 0.62 + 0.58 + 0.45$; leg II: $0.87 + 0.45 + 0.50 + 0.50 + 0.47$; leg III: $0.90 + 0.50 + 0.60 + 0.80 + 0.45$; leg IV: $1.25 + 0.50 + 0.75 + 0.87 + 0.50$. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.1-1; Mt v.2-2. Leg II: Fm d.1-1-1; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb rt.1-1, v.1-1ap.; Mt d.1-2ap., pr. and rt.1ap., v.2ap. Leg IV: Fm d.1-1-1; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.1-2-2ap., pr. and rt.1ap., v.1-2ap. Coloration. Carapace grey to brownish, sparsely covered with white hairs. Abdomen grey, covered with white scales dorsally and laterally. Legs light yellow, but femora and patellae brownish. Palp yellow with a brown patella. Epigyne and spermathecae as in Figs 6-8.

Heliophanus chovdensis Prószyński, 1982 Figs 10-21.

Heliophanus chovdensis Prószyński, 1982: 283, fig.34.

H. c.: Wesolowska, 1986: 222, figs 775, 888.

Material. KAZAKHSTAN: 2 ♀♀ (ZMMU), Almaty Area, Kurtinsk Distr., Aidarly, 23.05.1981, C. Tarabaev; 1 ♀ (ISE), same area and district, Aizaran, 23.05.1981, E. Taranov; 1 ♂ (ZISP), same locality, Basoi Tereskan, 11.09.1982, E. Taranov; 2 ♂♂, 1



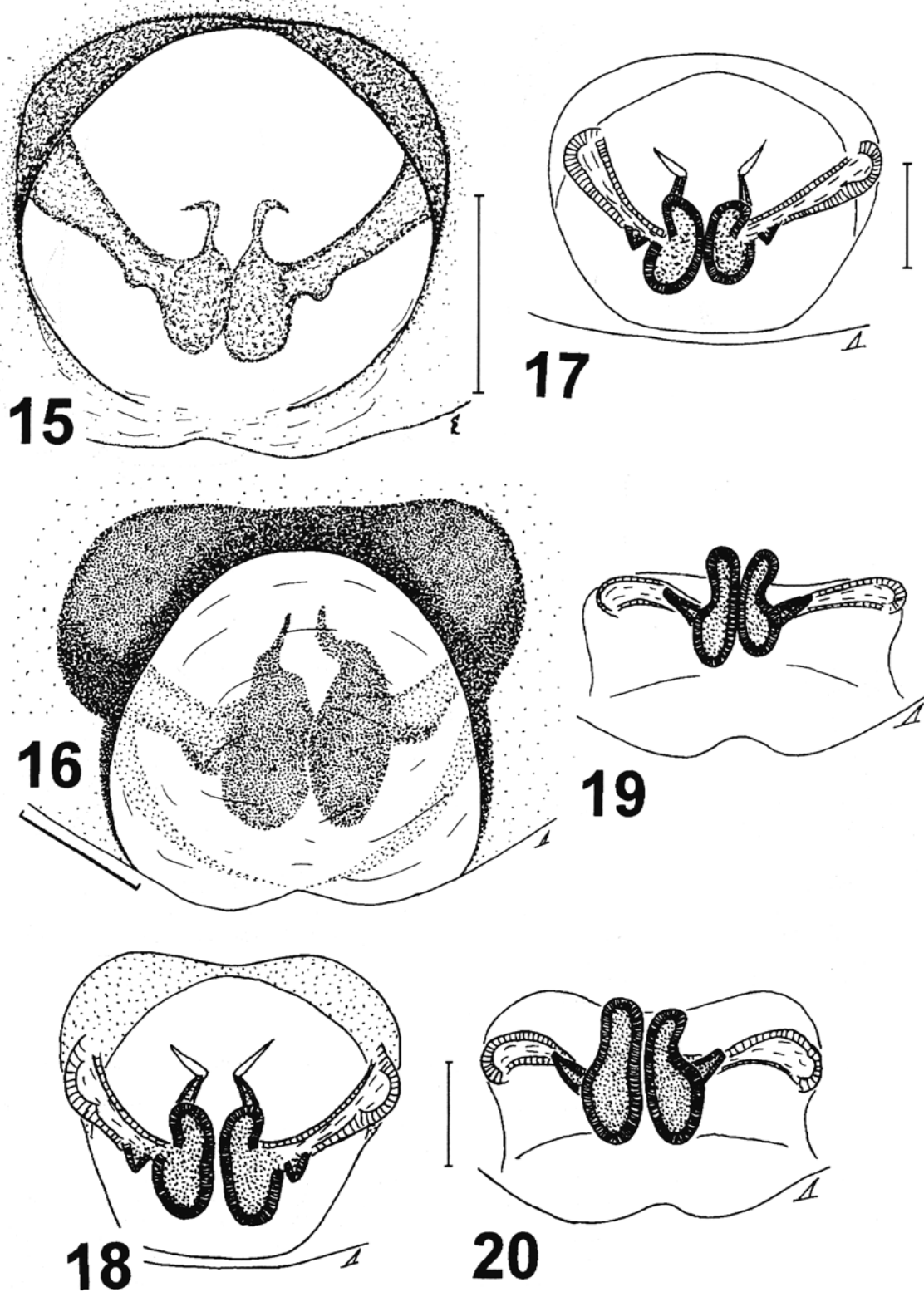
Figs 10-14. *Heliophanus chovdensis* (Prószyński, 1982): 10 — ♂ palp, ventral view; 11 — ditto, lateral view; 12 — ditto, dorsal view; 13 — palpal femur, lateral view; 14 — ditto, median view. Scale: 0.14 mm.

Рис. 10-14. *Heliophanus chovdensis* (Prószyński, 1982): 10 — палепа ♂, вентрально; 11 — то же, латерально; 12 — то же, дорсально; 13 — бедро палепы, латерально; 14 — то же, медиально. Масштаб: 0,14 мм.

♀ (ISE), same area, Talgar Distr., Kapchagai, 27.08.1992, D.L. & Y.M. Marusik; 1 ♂ (ISE), 11.09.1990, A.Z. & A. Fedorov; 1 ♂, 1 ♀ (ZMMU), same district, Kapchagaiskoye Reservoir, 11.09.1990, A.Z. & A. Fedorov; 1 ♂ (ZMMU), same area, Zarechnyi, 13.04.1989, S.I. Ibraev & A.A. Raikhanov; 1 ♀ (ZMMU), S-Kazakhstan Area, Arys Distr., 35 km W of Dostyk, Bairkum, Kyzylkum Desert, 21.05.1993, B.E. Koptykbaev & A.I. Ponomarenko; 1 ♂, 7 ♀♀ (ISE), Balkhash Distr., 24 km SE of Bakanas, 28.05.1995, A.Z.; 1 ♂ (ISE, 2003), same district, Bakanas, 15.09.1988, S. Ibraev & A.Z.; 1 ♀ (ISE, 118), Taldy-Kurgan Area, 63th road-km from Ush-Tobe to Akzhar, Irnazar, summer 1988, A.Z.; 1 ♀ (ISE), Zhambyl (= Dzhambul) Area, Chu River, near

Town Chu, 20.06.1989, A.Z. & C. Tarabaev; 1 ♂, 1 ♀ (ISE), same area and district, Gheorghievka, 22.05.1984, S.O.; 1 ♀ (ISE), same area, Moynkum Distr., 21 km S of Furmanovka, Moynkum Desert, 16.05.1992, A.Z. & A. Fedorov; 1 ♂ (ISE), same locality, 16.05.1983, Y.M. Marusik; 1 ♂ (ZMMU), same locality, 19.09.1983, Y.M. Marusik; 1 ♂ (ISE, 1982), 153rd road-km from Almaty to Karaganda, 5.05.1988, M.V. Zarko. — KYRGHYZSTAN: 1 ♀ (ISE), Inner Tian-Shan, E part of Susamyr-Too Mt. Range, middle flow of Kokomeran River, 21.06.1991, S.Z.

Comparative material. Holotype of *H. chovdensis*: 1 ♀ (HMNH, Nr. 626), Mongolia, Chovd Aimak, 10 km NW of Somon Ulene, 1500 m alt., 4.07.1966, Exp. Kaszab.



Figs 15-20. *Heliophanus chovdensis* (Prószyński, 1982): 15-16 — epigyne; 17-18 — spermathecae, dorsal view; 19-20 — ditto, rear view. 15-19 — holotype from Chovd Aimak, Mongolia. Scale: 0.14 mm.

Рис. 15-20. *Heliophanus chovdensis* (Prószyński, 1982): 15-16 — эпигина; 17-18 — сперматека; 19-20 — то же, вид сзади. 15-19 — голотип из Ховдинского Аймака, Монголия. Масштаб: 0,14 мм.

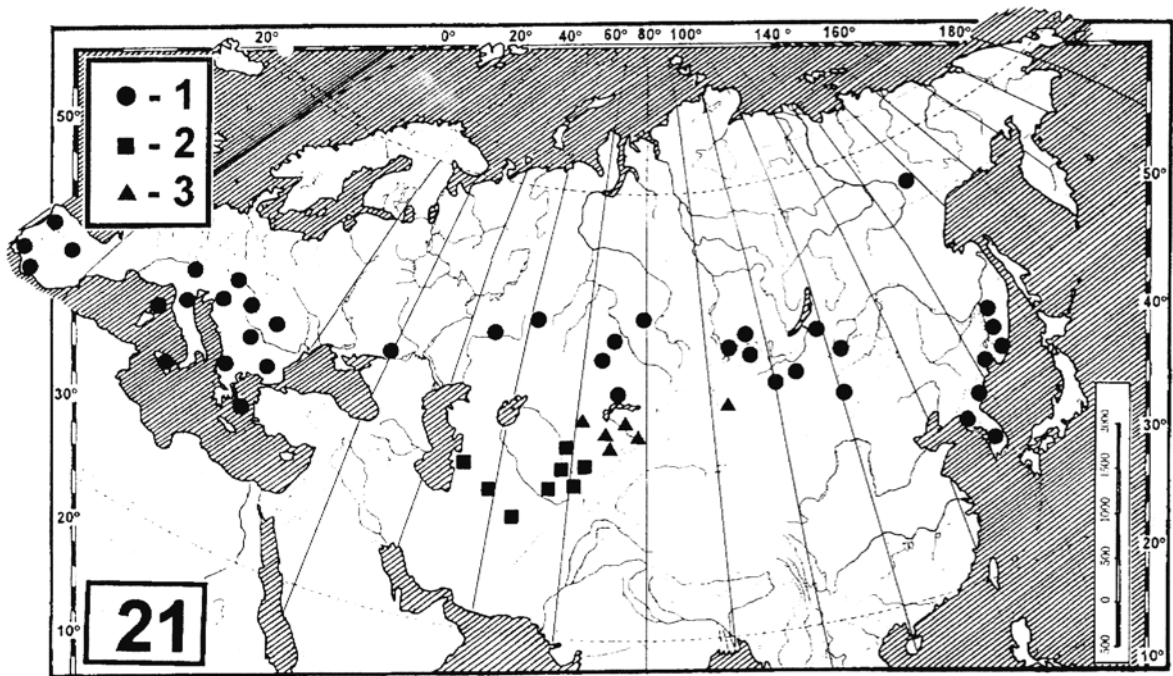


Fig. 21. Localities of *H. lineiventris* (1), *H. turanicus* (2) and *H. chovdensis* (3) in Eurasia.

Рис. 21. Местонахождения *H. lineiventris* (1), *H. turanicus* (2) и *H. chovdensis* (3) в Евразии.

Diagnosis. *H. chovdensis* is most closely related to *H. turanicus* Kharitonov, 1969, and *H. lineiventris* Simon, 1868, and, in most cases, both ♂♂ and ♀♀ can be separated only when compared side-by-side, directly. The ♂ of *H. lineiventris* differs from that of other closely related congeners by the longest (spiniform) additional tibial apophysis (Figs 97-99). The ♂ of *H. chovdensis* and *H. turanicus* can be separated by the shape of the curved embolus (cf. Figs 10 and 132). Among these species, the ♀ of *H. chovdensis* is the easiest to be distinguished, differing in the position of the insemination ducts which originate from the anterior edge of the epigynal depression and are usually visible through the integument at the bottom of the depression as a pair of tubes sloping toward each other (Figs 15-20). The ♀ of *H. lineiventris* and *H. turanicus* are poorly distinguishable. The latter species seems to differ in displaying a more transverse depression of the epigyne (Figs 28, 30) and wider insemination ducts (Figs 55-58).

Distribution. This Kazakhstan-West Mongolian species (Fig. 21), has hitherto been known from the type locality only: Mongolia, Chovd Aimak, Somon Uene [Prószyński, 1982].

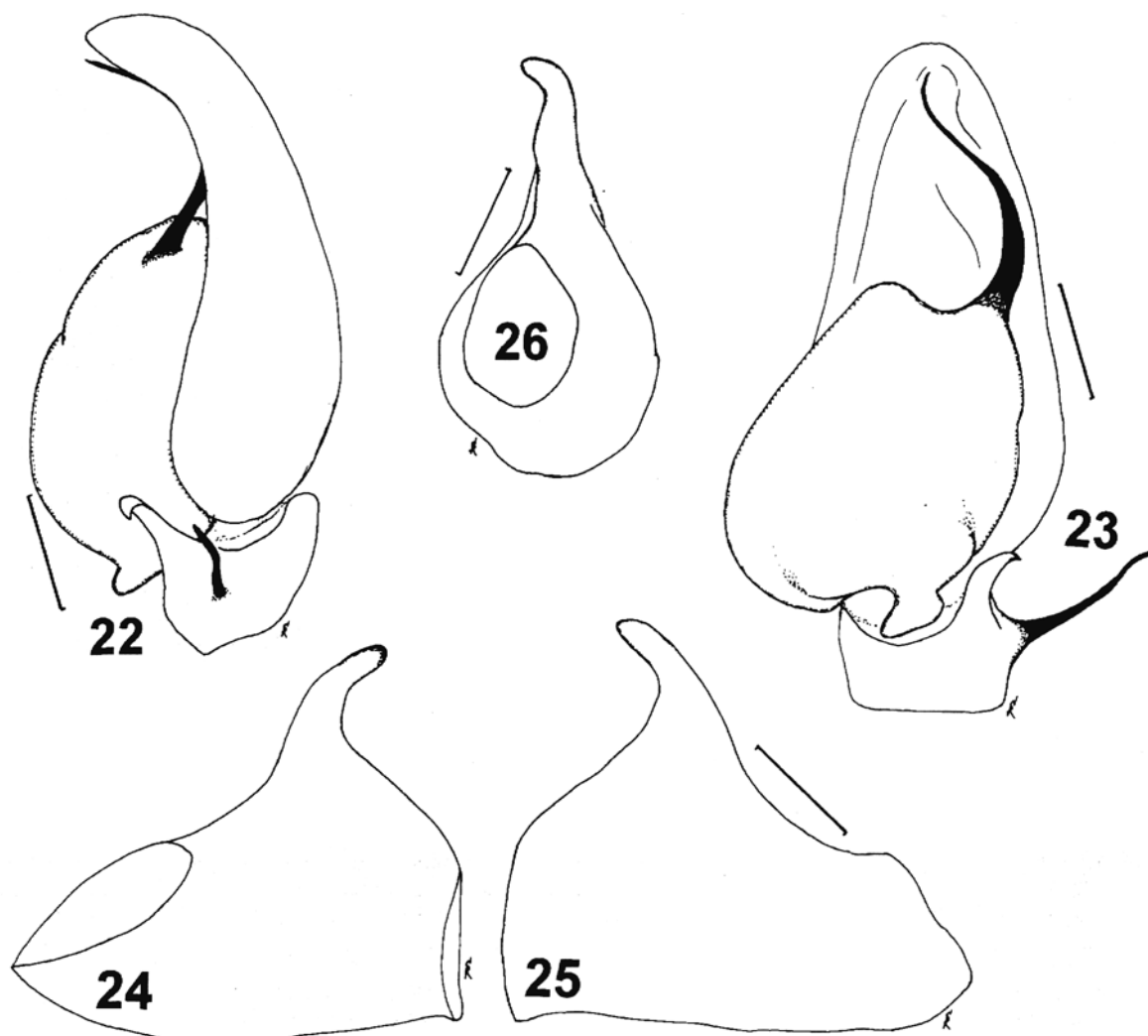
Description. MALE. Carapace 2.25 long, 1.74 wide and 1.10 high at PLE. Abdomen 2.25 long, 1.60 wide. Cheliceral length 0.75. Ocular area 1.00 long, 1.10 wide anteriorly and 1.25 wide posteriorly. Diameter of AME 0.35. Length of leg segments: leg I: 1.36 + 0.75 + 0.75 + 0.75 + 0.63; leg II: 1.25 + 0.65 + 0.62 + 0.88 + 0.60; leg III: 1.38 + 0.68 + 0.84 + 0.70 + 0.65; leg IV: 1.38 + 0.62 + 1.06 + 1.10 + 0.70. Leg spination. Leg I: Fm d.1-1-1ap., pr.1ap.; Tb pr.0-1, v.1-2ap.; Mt v.2-2ap. Leg II: Fm d.1-1-1ap., pr.1ap.; Tb pr.1-1, v.1-1ap., Mt v.2-2ap. Leg III: Fm d.1-1-1ap., pr.1ap.; Tb pr. and rt.1-1, v.2ap.; Mt d.2-2ap., pr. and rt.1 ap., v.1-2ap. Leg IV: Fm d.1-1-1,

pr.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.2-2ap, pr. and rt.1ap., v.2ap. Coloration. Carapace dark brown, bordered by a line of white scales. Eye field black. Sternum and labium grey. Maxillae light brown. Chelicerae dark brown. Abdomen grey. Dorsum with five white spots, venter with a pair of white patches in front of spinnerets. Legs brown with yellow metatarsi. Palpal structure as in Figs 10-14.

FEMALE. Carapace 2.00-2.50 long, 1.50-1.94 wide and 0.85-1.00 high at PLE. Abdomen 2.25-4.00 long, 1.66-3.00 wide. Cheliceral length 0.65-0.85. Ocular area 0.90-0.95 long, 1.10-1.25 wide anteriorly and 1.14-1.15 wide posteriorly. Diameter of AME 0.35. Length of leg segments: leg I: 1.02 + 0.53 + 0.65 + 0.60 + 0.50; leg II: 0.81 + 0.53 + 0.50 + 0.54 + 0.48; leg III: 1.09 + 0.49 + 0.51 + 0.75 + 0.53; leg IV: 1.38 + 0.50 + 1.05 + 1.08 + 0.62. Leg spination. Leg I: Fm d.1-1-1ap., pr.1ap.; Tb pr.0-1, v.2-2ap.; Mt v.2-2ap. Leg II: Fm d.1-1-1ap., pr.1ap.; Tb pr.1-1, v.1-1; Mt v.2-2ap. Leg III: Fm pr.1ap., d.1-1-1; Tb pr. and rt.1-1, v.1ap.; Mt d.1-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1; Tb pr. and rt.1-1, v.1-2ap.; Mt pr. and rt.1ap., d.1-2ap. Coloration as in male, but carapace lacking a cover of white scales, and legs lighter. Abdomen: Dorsum grey, with a white anterior band and a pair of white spots in back part thereof; venter with a median longitudinal stripe of white scales and a pair of white patches in front of spinnerets. Palpal femora brown, remaining palpomeres yellow. Epigyne and spermathecae as in Figs 15-20.

Heliophanus cupreus (Walckenaer, 1802)
Figs 22-27, 31-32, 35.

H. c.: Ovtsharenko, 1978: 683; Dunin, 1979: 38; 1984: 58; 1989: 38; Kharitonov, 1932: 178-179; Prószyński, 1976: map 82;



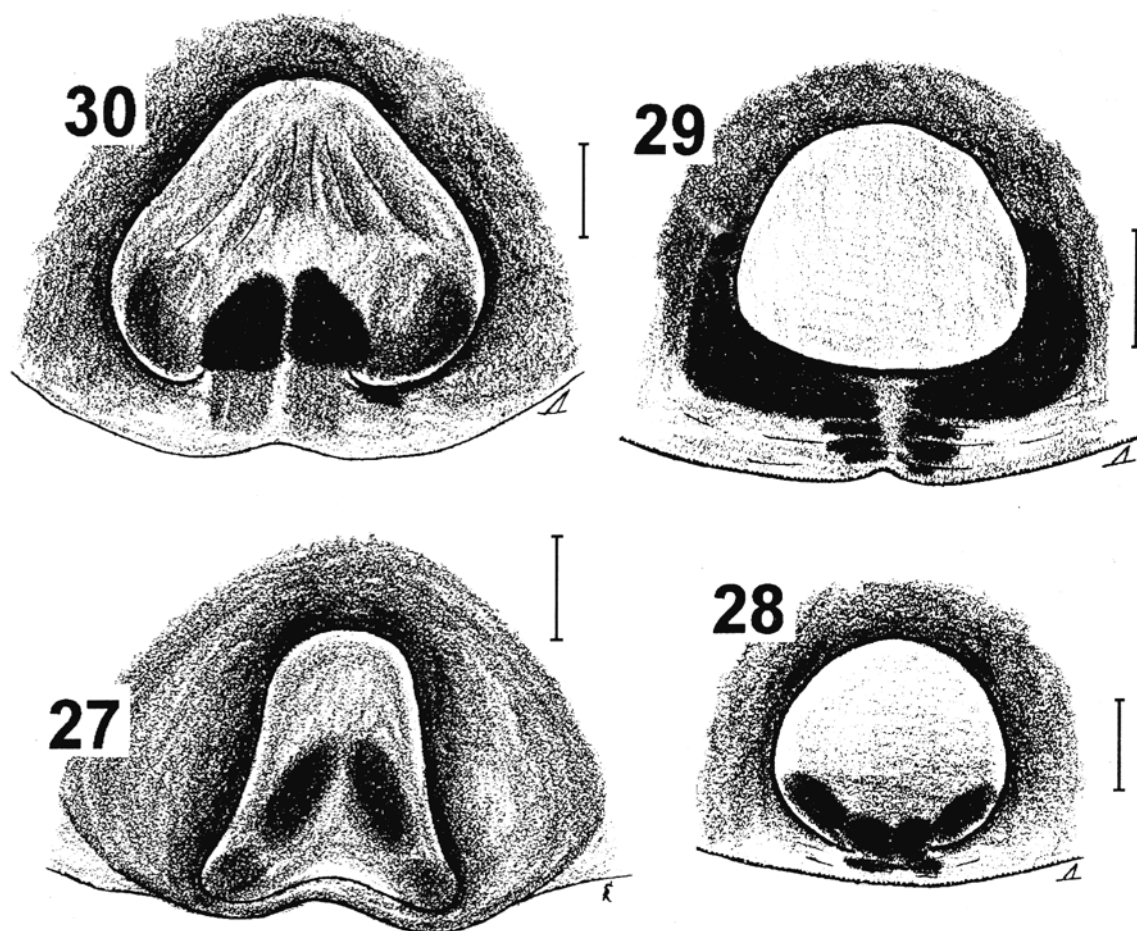
Figs 22-26. *Heliophanus cupreus* (Walckenaer, 1802): 22 — ♂ palp, lateral view; 23 — ditto, ventral view; 24 — palpal femur, lateral view; 25 — ditto, median view; 26 — ditto, proximal view. Scale: 0.14 mm.

Рис. 22-26. *Heliophanus cupreus* (Walckenaer, 1802): 22 — палепа ♂, латерально; 23 — то же, вентрально; 24 — бедро палепы, медиально; 25 — то же, латерально; 26 — то же, вид проксимально. Масштаб: 0,14 мм.

Minoranskii et al., 1984: 77; Wesolowska, 1986: 215-216, figs 671-683, 894.

Material. CRIMEA: 1 ♀ (ZMMU), Bakhchisaray, Kuibyshevo, 14.08.1981, V.A. Bragina; 3 ♂♂, 2 ♀♀ (ISE), 1 ♂ (ZISP), same locality, 5-26.06.1993, S.V. Vasilenko; 2 ♂♂ (ISE), Belogorsk Distr., Karasiovka, 30.05-3.06.1981, V.A. Bragina; 3 ♂♂, 1 ♀ (ZMMU), Simferopol' Distr., Krasnolesie, 11.07.1981, V.A. Bragina; 1 ♂ (ISE), Martian Peninsula, 21.07.1981, V.A. Bragina. — KRASNODAR PROVINCE: 4 ♂♂, 6 ♀♀ (ISE), 6 ♀♀ (ZISP), Caucasian State Reserve, Guzeripl, 800-1500 m alt, 13-29.07.1974, V.O.; 6 ♂♂, 14 ♀♀ (ZISP), 1 ♂, 9 ♀♀ (ISE), same locality, 13.06-20.07.1976, V.O.; 1 ♂ (ZMMU), same locality, 13.06.1991, K.G. Mikhailov; 3 ♀♀ (ZISP), same locality, Aishkho Mt., 1800-1900 m alt, 18.07-16.08.1976, V.O.; 1 ♂ (ZISP), same locality, Pseashkho Mt., 17.07.1976, V.O.; 1 ♂ (ZISP), same locality, Krasnaya Polyana, 500 m alt, 26.08.1976, V.O.; 2 ♂♂, 6 ♀♀ (ZISP), Maikop, 8-9.06.1976, V.O.; 2 ♀♀ (ZISP), Khosta, 15.06.1976, V.O.; 2 ♂♂, 1 ♀ (ZISP), same locality, 17.06.1975, V.O.; 3 ♀♀ (ZISP), Adler, 28.07.1976, V.O. — NORTH OSSETIA: 1 ♀ (ZMMU), Canyon Tsei, Tsei River, 20.06.1981, S.K. Alekseev; 1 ♀ (ZMMU), Buron, Canyon Kasarskoye, Uiltsa, 18.06.1981, S.K. Alekseev; 1 ♂ (ZMMU), Alaghir, 28.06.1985, K.G. Mikhailov. — KABARDINO-

BALKARIA: 1 ♀ (ZMMU), Teberda State Reserve, Teberda River Valley, 1300 m alt, 1.07.1986, I.M. Marova; 1 ♂, 2 ♀♀ (ZISP), Cheghet Mt., 2200 m alt, 3.07.1976, V.O. — GEORGIA: 3 ♀♀ (ZISP), Lagodekhi Reserve, 7.01.1982, Y.M. Marusik. — AZERBAIJAN: 1 ♀ (ZISP), Lenkoran, 10.06.1984, P.D.; 7 ♂♂, 2 ♀♀ (ISE), 3 ♂♂, 6 ♀♀ (ZISP), Lenkoran Distr., Gaftoni, 4.05-20.06.1985, P.D.; 4 ♂♂, 13 ♀♀ (ISE), 4 ♀♀ (ZMMU), 1 ♂, 5 ♀♀ (ZISP), same distr., Hyrcan Reserve, 16-28.06.1983, D.L.; 1 ♀ (ISE), same locality, 20.06.1985, P.D.; 2 ♀♀ (ZMMU), 16.08.1983, P.D.; 3 ♀♀ (ZMMU), same distr., Osakiuja, 10.05.1985, P.D.; 2 ♀♀ (ISE), Baku, 6.06.1989, P.D.; 1 ♂, 5 ♀♀ (ZMMU), Apsheron Distr., Altyagach, 1000 m alt, 19.09.1979, P.D.; 1 ♂, 7 ♀♀ (ISE), 7 ♀♀ (ZMMU), Sheki Distr., 5-10 km N of Sheki, Ghilarsen-Ghilarsen, 1000 m alt, 24-26.06.1978, P.D.; 11 ♂♂, 8 ♀♀ (ISE), 6 ♂♂, 4 ♀♀ (ZMMU), 4 ♂♂, 3 ♀♀ (ZISP), 20-25 km NE of Shemakha, Pirkuli Reserve, 1100-1500 m alt, 23.05-4.08.1984, D.L.; 1 ♂ (ZMMU), Zakataly Reserve, 1000 m alt, 15-16.06.1986, K.G. Mikhailov; 1 ♂ (ZMMU), Dzhar, Chiliban Mt. Range, 200 m alt, 8.07.1981, P.D.; 2 ♂♂, 5 ♀♀ (IZE), Khachmas Distr., Nabran, 7-14.07.1976, P.D.; 1 ♂, 4 ♀♀ (ZMMU), same distr., Yalama, 13.06.1978, P.D.; 2 ♀♀ (ISE), Kuba Distr., Kacheresh, 19.06.1976, P.D.



Figs 27-30. Epigynes of *H. cupreus* (27), *H. lineiventris* (28), *H. dunini* (29) and *H. turanicus* (30). Scale: 0.1 mm.
Рис. 27-30. Эпигины *H. cupreus* (27), *H. lineiventris* (28), *H. dunini* (29) и *H. turanicus* (30). Масштаб: 0,1 мм.

Diagnosis. See comments in "Diagnosis" under *H. dunini*.

Distribution. This European (s.l.) species [Wesołowska, 1986: fig. 894; Prószyński, 1976: map 82] has hitherto been reported from the Caucasus: Georgia [Spassky 1937; Mkheidze, 1964], Chechnya [Minoranskii et al., 1984; Minoranskii, 1988], the western parts of the Caucasus Major [Ovtsharenko, 1978], with Azerbaijan [Dunin, 1979, 1984, 1989] obviously representing the easternmost limit of *H. cupreus* distribution. All localities of *H. cupreus* in the Caucasus are shown in Fig. 35.

Habitat. The species seems to be restricted to swamps, grassy meadows and glades, as well as to birch forests.

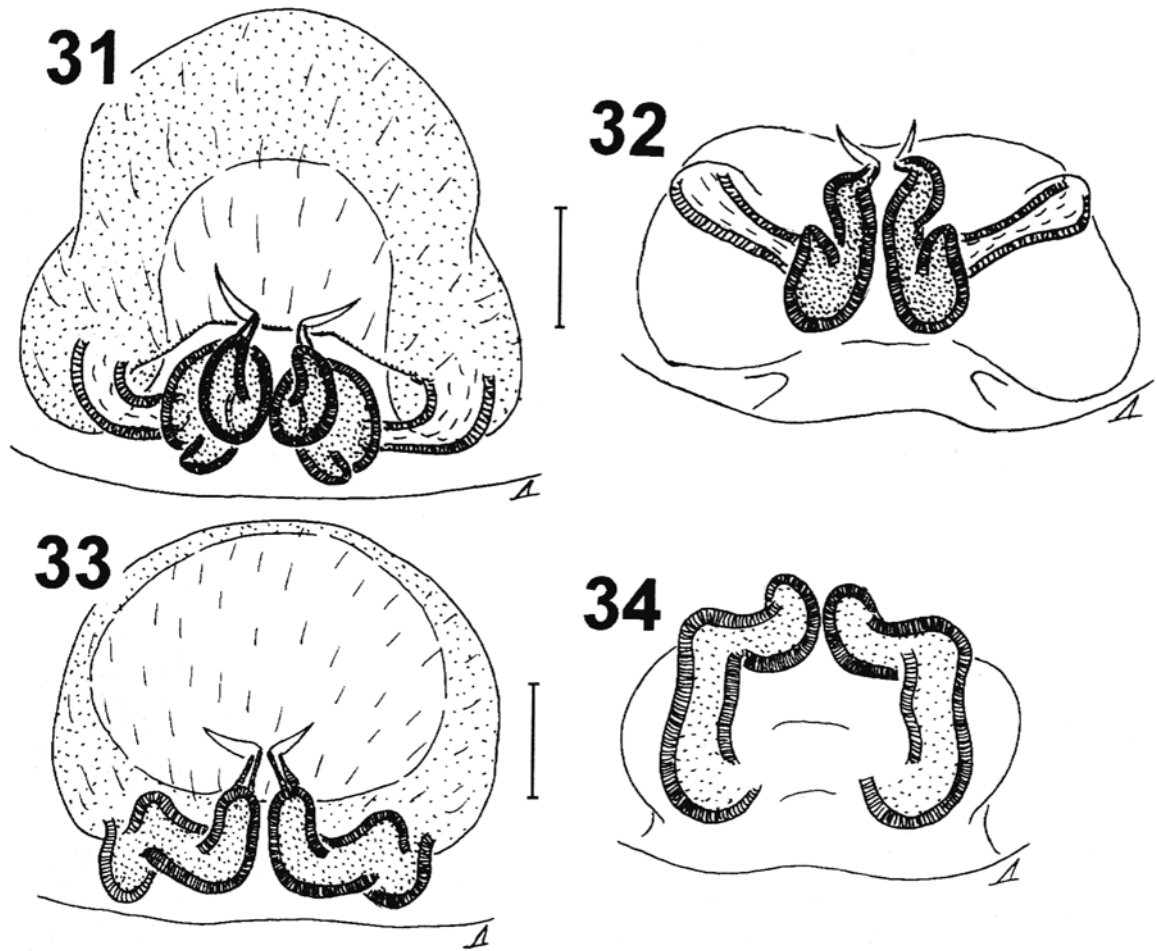
Description. MALE. Measurements. Carapace 1.74 long, 1.25 wide, 0.90 high at PLE. Ocular area 0.85 long, 1.00 wide anteriorly and 1.06 wide posteriorly. Diameter of AME 0.48. Abdomen 2.00 long, 1.25 wide. Cheliceral length 0.94. Length of leg segments: leg I: $0.87 + 0.50 + 0.75 + 0.50 + 0.43$; leg II: $0.62 + 0.43 + 0.50 + 0.62 + 0.50$; leg III: $0.75 + 0.36 + 0.50 + 0.62 + 0.36$; leg IV: $1.00 + 0.36 + 0.75 + 0.75 + 0.50$. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.2-2; Mt v.2-2ap. Leg II: Fm d.1-1-1; Tb v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1; Tb pr.0-1, rt.1-1-1, v.1ap.; Mt d.2ap. pr. and rt.1ap., v.1-2. Leg IV: Fm d.1-1-1; Tb pr.0-1, rt.1-1-1, v.1ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Coloration as in ♂, but legs yellow with brown spots. Palpal femora yellow. Sternum grey. Maxillae and labium brown. Dorsum bordered anteriorly and on sides by a white line. Epigyne and spermathecae as in Figs 27, 31-32.

v.1-1ap. Coloration typical for *Heliophanus*. Carapace dark brown. Eye field black. Sternum, labium, maxillae and chelicerae brown. Legs orange, with pro- and retrolateral longitudinal brown lines. Abdomen grey. Palpal structure as in Figs 22-26.

FEMALE. Measurements. Carapace 2.30 long, 1.50 wide, 1.00 high at PLE. Ocular area 0.85 long, 1.06 wide anteriorly and 1.10 wide posteriorly. Diameter of AME 0.35. Abdomen 3.00 long, 2.00 wide. Cheliceral length 0.94. Length of leg segments: leg I: $0.94 + 0.50 + 0.75 + 0.62 + 0.50$; leg II: $0.87 + 0.50 + 0.62 + 0.50 + 0.50$; leg III: $1.00 + 0.45 + 0.62 + 0.75 + 0.62$; leg IV: $1.20 + 0.42 + 1.00 + 1.13 + 0.84$. Leg spination. Leg I: Fm d.1-1-1; Tb v.2-2; Mt v.2-2ap. Leg II: Fm d.1-1-1; Tb v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1; Tb pr.0-1, rt.1-1-1, v.1ap.; Mt d.2ap. pr. and rt.1ap., v.1-2. Leg IV: Fm d.1-1-1; Tb pr.0-1, rt.1-1-1, v.1ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Coloration as in ♂, but legs yellow with brown spots. Palpal femora yellow. Sternum grey. Maxillae and labium brown. Dorsum bordered anteriorly and on sides by a white line. Epigyne and spermathecae as in Figs 27, 31-32.

Heliophanus curvidens (O. P.-Cambridge, 1872)
Figs 9, 36-42.

H. c.: Neñilin, 1984a: 17; 1985: 130; Logunov, 1992: 66;



Figs 31-34. Spermathecae of *H. cupreus* (31-32) and *H. kochi* Simon, 1868 (33-34): 31, 33 — dorsal view; 32, 34 — rear view. Scale: 0.1 mm.

Рис. 31-34. Сперматеки *H. cupreus* (31-32) и *H. kochi* (33-34): 31, 33 — вид дорзально; 32, 34 — вид сзади. Масштаб: 0.1 мм.

Zyuzin & Tarabaev, 1994: 400; Mikhailov & Fet, 1994: 517; Wesolowska, 1996: 29.

H. berlandi: Prószyński, 1976: map 74.

Material. AZERBAIJAN: 2 ♀♀ (ISE), Lerik Distr., Zuvand, Gosmalian, 1300 m alt., 21.07.1983, D.L.; 1 ♀ (ZMMU), Lenkoran Distr., Gaftoni, 2000 m alt., 19.07.1980, S. Dashdamirov; 3 ♂♂, 1 ♀ (ISE), same locality, 13.05.1985, P.D. — KAZAKHSTAN: 2 ♂♂, 3 ♀♀ (ISE), Almaty Area, Kapchagai, 10.05.1986, A.Z.; 2 ♂♂ (ISE), Pavlodar Area, Mayskoe Distr., Tundyk, 31.06.1990, O.L.; 1 ♀ (ZMMU), S-Kazakhstan Area, 102 km NW of Bairkum, 28.05.1993, A.Z.; 3 ♂♂ (ISE), Zhambyl (= Dzhambul) Area, Sarysuk Distr., 4-76 km N of Ulanbel, Betpak-Dala Desert, 4.05.1990, A. Fedorov; 1 ♂ (ISE), same locality, 4.10.1991, A.Z. & A. Fedorov; 1 ♂ (ISE), same area, Gheorghievka, 22.05.1984, S.O. — UZBEKISTAN: 1 ♂ (ZISP), Surkhadaryinskaya Area, Kuhitangtau Mt. Range, Bazar-Dara, 1500 m alt., 7.05.1984, S.Z.; 2 ♂♂, 1 ♀ (ZMMU), same area and range, Kumpyr-Tepa, 15.05.1984, A.V. Tanasevitch; 1 ♂ (ZISP), Tashkent Area, Charvakskeye Reservoir, 11.05.1981, A.B. Nenilin. — TURKMENISTAN: 1 ♀ (ZISP), Bakharden Distr., Zhdanova Kolkhoz, 21.06.1977, V.Y. Fet; 30 ♂♂, 1 ♀ (ISE), 10 km S of Bakharden, 3.04.1993, D.L.; 2 ♂♂ (ISE), Badkhyz Reserve, Canyon Kyzyl-Dzhar, 10.04.1993, D.L.; 2 ♂♂ (ISE), SW Kopetdagh, Kara-Kala, 29.03.1993, D.L. & S.O.; 3 ♂♂, 1 ♀ (ISE), same locality, 3.04.1993, A.Z.; 4 ♂♂, 1 ♀ (ISE), 8 km NE of Nebit-Dag, Bolshoi Balkhan Mts., 380-1000 m alt., 1-2.04.1993, D.L. & A.Z.; 5 ♂♂, 2 ♀♀ (ISE), 40 km SE of Polekhatum, Zulfagarskii Mt. Range, 1000 m alt.,

14.04.1993, D.L.; 7 ♂♂, 1 ♀ (ISE), 20-25 km SE of Polekhatum, Ghezhgiadyk Mt. Range, 500-1000 m alt., 16.04.1993, D.L.; 1 ♂, 2 ♀♀ (ISE), Firyuza, 5.04-1.05.1991, V.D.; 1 ♂ (ISE), Ashkhabad, 14.04.1991, V.D. & V.K. Zinchenko; 1 ♀ (ZMMU), Kuhitangtau Mt. Range, W slope, Dzhelau Plateau, Airi-Baba Mt., 2000-2300 m alt., 04.1991, V.D.; 1 ♂, 5 ♀♀ (ISE), same range, Kara-Belent Mts., 14-19.04.1991, V.D.; 1 ♂, 2 ♀♀ (ISE), same range, Bazar-Tepe, 13-19.05.1991, V.D.; 1 ♂ (ISE), same range, Khodzhaipil, 1000 m alt., date ?, S.O. — TAJIKISTAN: 3 ♂♂ (ISE), Kurgan-Tyube Area, Ilyichevsk Distr., Aktau Mt. Range, Gandzhino, 15-19.04.1986, S.O. & S.Z.; 4 ♂♂ (ISE), same locality, 17.03-20.04.1991, S.O.; 1 ♀ (ZISP), same area, Karatau Mt Range, 17-18.05.1986, S.Z.; 1 ♀ (ZMMU), Leninabad, 27-30.06.1959, A.P. Rasnitsyn. — KYRGYZSTAN: 1 ♀ (ISE), Susamyrttoo Mt. Range, 3-8 km SW of Kyzyl-Oi, Kobuksu River Valley, summer 1993, D.M.; E part of Kirghizskii Mt. Range, Orlovka, 16.06.1992, S.O.; 1 ♂ (ZISP), NW part of Kirghizskii Mt. Range, Alash, 26.05.1993, D.M.; 1 ♀ (ISE), Chu Valley, Kok-Dzhar, 28.05.1985, S.O.; 2 ♀♀ (ISE), Talas Area, Toktogul Distr., 25 km NE of Kara-Kul Mt., Pass Kok-Bel, ca. 1500 m alt., 26.06.1992, A.Z. & A. Fedorov; 1 ♀ (ISE), Narynskii Mt. Range, Sapkyntor, 15.07.1987, S.O.; 1 ♀ (ISE), Issyk-Kul Area, Lake Kara-Kul, 1600 m alt., 15.08.1984, S.O.

Diagnosis. *H. curvidens* differs from all Central Asian congeners by the presence of a short pointed protuberance on the tegulum (arrowed in Fig. 36) and by the narrow transverse hole of the epigyne (Fig. 41).

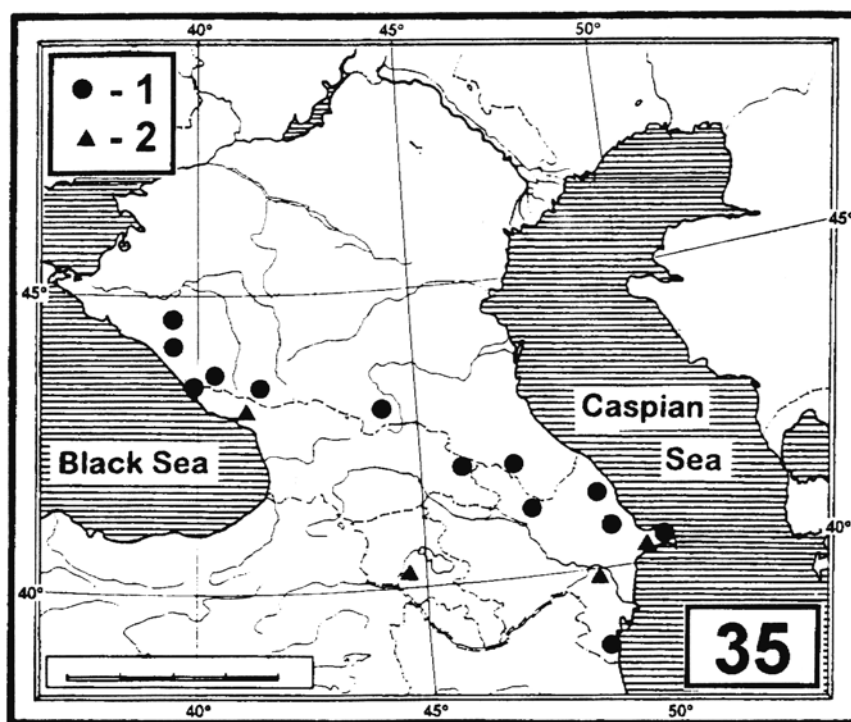


Fig. 35. Localities of *H. cupreus* (1) and *H. equester* (2) in the Caucasus.

Рис. 35. Местонахождения *H. cupreus* (1) и *H. equester* (2) на Кавказе.

Distribution. The species' distribution covers a narrow subboreal area ranging from the Near East in the west to W-China: Gansu and Karakorum (China/Pakistan border) in the east [s. Wesolowska, 1986: 884]. *H. curvidens* has hitherto been reported from Turkmenistan: Bakharden, Bolshoi Balkhan and Sakka [Mikhailov & Fet, 1994; Wesolowska, 1996]; Kazakhstan: Ustyurt Plateau, Moiynkum Desert, Semipalatinsk Area (Kokpekti) [Logunov, 1992a; Zyuzin & Tarabaev, 1994], and Tajikistan [Nenilin, 1984a]. All localities of *H. curvidens* in Middle Asia and in the Caucasus are shown in Fig. 9.

Description. MALE. Measurements. Carapace 1.50-1.69 long, 1.00-1.35 wide, 0.60-0.75 high at PLE. Ocular area 0.50-0.63 long, 0.80-0.90 wide anteriorly and 1.09-1.00 wide posteriorly. Diameter of AME 0.25-0.30. Abdomen 1.50-1.74 long, 1.00-1.10 wide. Cheliceral length 0.47-0.53. Length of leg segments: leg I: 0.60-0.75 + 0.35-0.37 + 0.50-0.63 + 0.37-0.41 + 0.36-0.39; leg II: 0.62-0.68 + 0.38-0.39 + 0.37-0.46 + 0.38-0.50 + 0.35-0.38; leg III: 0.75-0.80 + 0.35-0.53 + 0.53-0.63 + 0.59-0.62 + 0.36-0.38; leg IV: 0.87-1.00 + 0.32-0.38 + 0.58-0.75 + 0.53-0.75 + 0.49-0.50. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.1-2; Mt v.2-2ap. Leg II: Fm d.1-1-1; pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.1-2-2ap., pr. and rt.1ap., v.1-2ap. Coloration typical for *Heliophanus*. Legs brown with yellow metatarsi and tarsi. Dorsum brown with three pairs of white spots. Palpal structure as in Figs 36-40.

FEMALE. Measurements. Carapace 1.75 long, 1.25 wide, 0.78 high at PLE. Ocular area 0.70 long, 1.00 wide anteriorly and 1.15 wide posteriorly. Diameter of AME

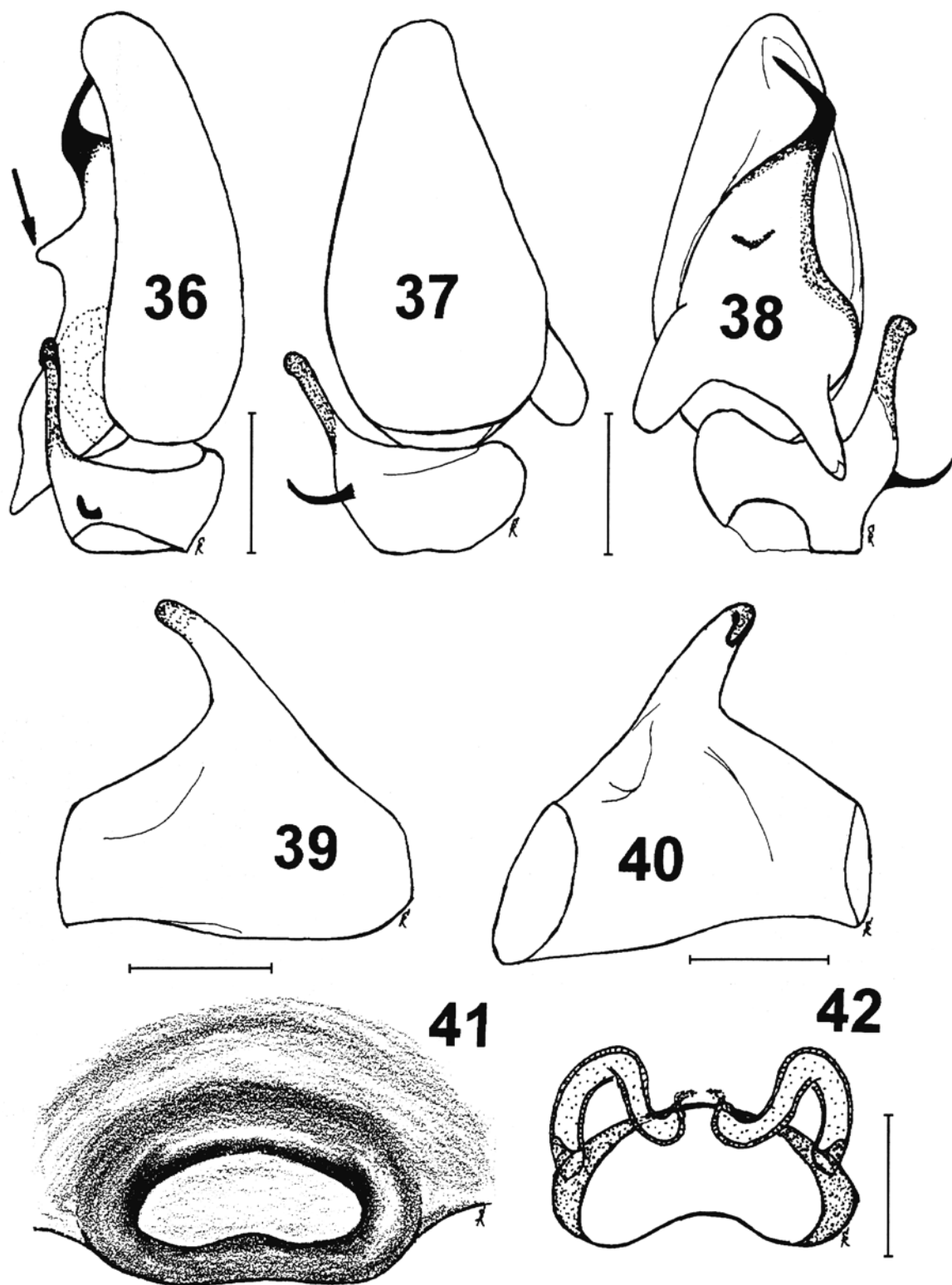
0.30. Abdomen 2.50 long, 1.50 wide. Cheliceral length 0.50. Length of leg segments: leg I: 0.81 + 0.50 + 0.52 + 0.50 + 0.42; leg II: 0.75 + 0.45 + 0.47 + 0.42 + 0.38; leg III: 0.78 + 0.47 + 0.52 + 0.62 + 0.50; leg IV: 1.13 + 0.50 + 0.87 + 0.90 + 0.50. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.1-2; Mt v.2-2. Leg II: Fm d.1-1-1; Tb pr.0-1, v.1-1; Mt v.1-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb rt. and pr.1-1, v.1ap.; Mt d.1-2ap., pr. and rt.1ap., v.2ap. Leg IV: Fm d.1-1-1; Tb pr.1-1, rt.1-1-1, v.1-1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Coloration as in ♂, but legs lighter, and dorsum only with one pair of white spots and bordered anteriorly and on sides by a white line. Epigyne and spermathecae as in Figs 41-42.

Heliophanus dubius C.L. Koch, 1835 Figs 9, 43-50.

H. d.: Nenilin, 1984a: 17-18; Savelieva, 1990: 173; Ovtsharenko, 1978: 683; Dunin, 1979: 38; 1984: 58; 1989: 38; Prószyński, 1976: map 73.

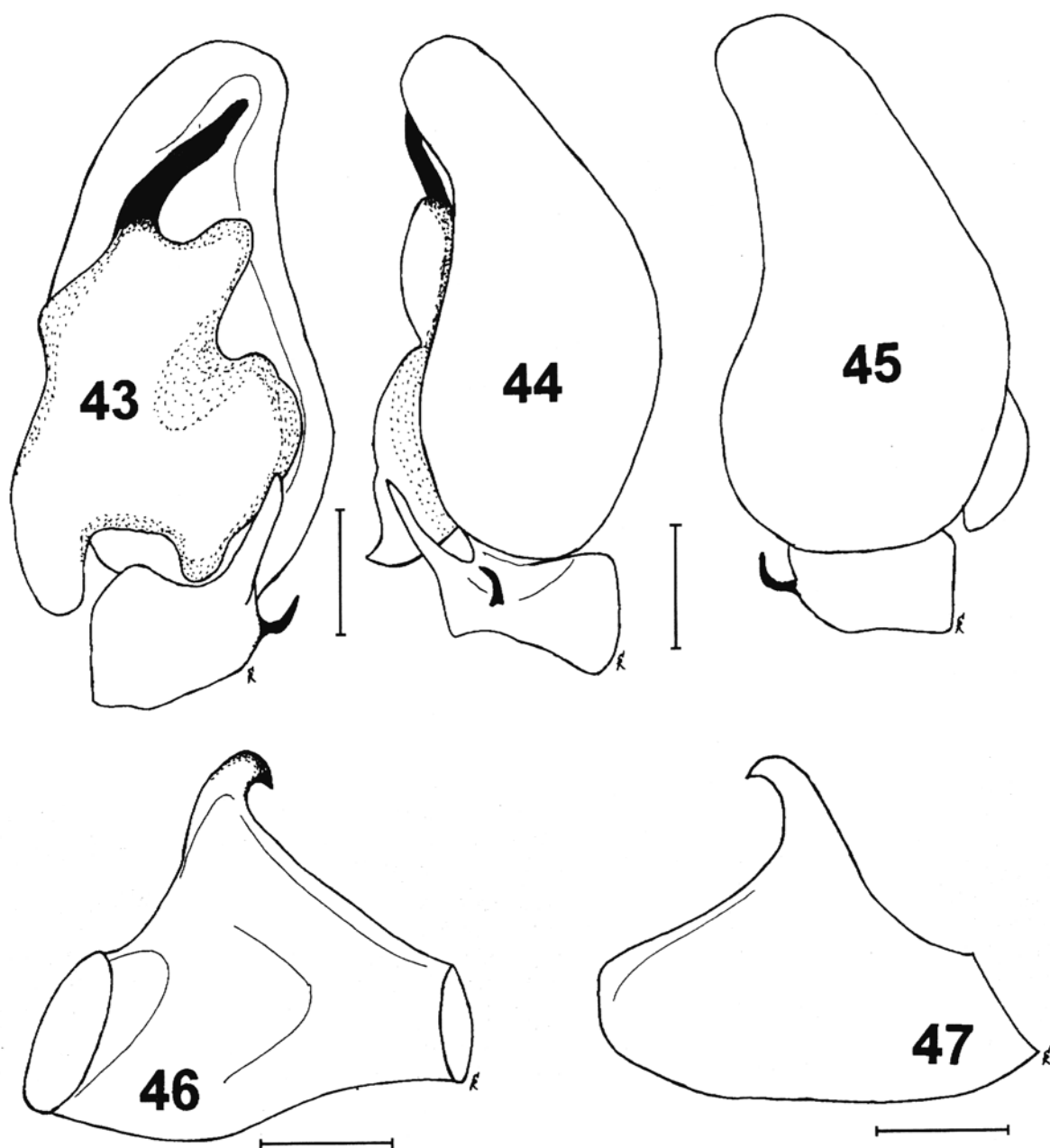
Material. GEORGIA: 1 ♂, 1 ♀ (ZMMU), 15 km W of Adigheni, 1500-1700 m alt., 14-15.05.1983, S.I. Golovatch. — KAZAKHSTAN: 2 ♂♂ (ISE), N-Kazakhstan Area, Sokolovo Distr., Bolshaya Malyska, 15.06.1988, D.L.; 1 ♀ (ISE), environs of Pavlodar, Irtysh River Valley, 20.06.1994, O.L.

Diagnosis. The ♂ is extremely similar to that of *H. aeneus*, but differs in having the stronger embolus and the hook-shaped tip of the femoral process [cf. Wesolowska, 1986: 612-615]. The ♀ can be mistaken for that of *H. simplex* Simon, 1868, the latter taxon known from SE-Europe, and that is why *H. dubius* has repeatedly been reported from S-Siberia and C-Asia, e.g. by Savelieva [1970], under the name of *H. simplex*. However, a direct comparison of ♀♀ of both species [cf. Figs 48-50 and figs



Figs 36-42. *Heliophanus curvidens* (O. P.-Cambridge, 1872): 36 — ♂ palp, lateral view; 37 — ditto, dorsal view; 38 — ditto, ventral view; 39 — palpal femur, lateral view; 40 — ditto, median view; 41 — epigyne; 42 — spermathecae. Scale: 0.14 mm.

Рис. 36-42. *Heliophanus curvidens* (O. P.-Cambridge, 1872): 36 — палепа ♂, вентрально; 37 — то же, дорсально; 38 — то же, вентрально; 39 — бедро палепы, латерально; 40 — то же, медиально; 41 — эпигина; 42 — сперматека. Масштаб: 0,14 мм.



Figs 43-47. *Heliophanus dubius* C. L. Koch, 1835: 43 — ♂ palp, ventral view; 44 — ditto, lateral view; 45 — ditto, dorsal view; 46 — palpal femur, median view; 47 — ditto, lateral view. Scale: 0.14 mm.

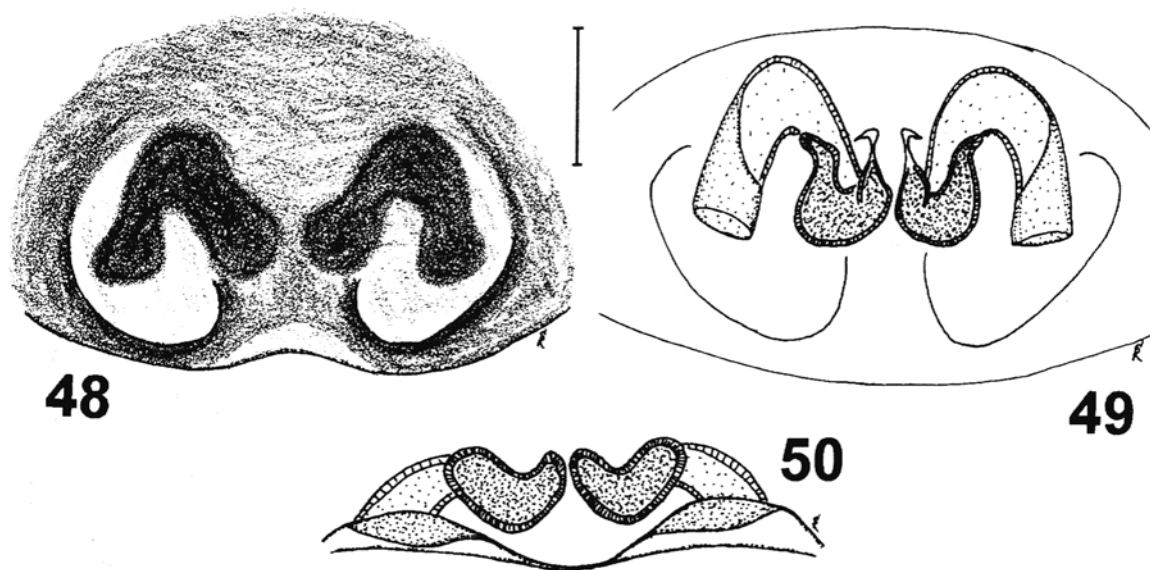
Рис. 43-47. *Heliophanus dubius* C. L. Koch, 1835: 43 — палепа ♂, вентрально; 44 — то же, латерально; 45 — то же, дорсально; 46 — бедро самца медиально; 47 — то же, латерально. Масштаб: 0.14 мм.

607-611 in Wesołowska, 1986] always shows small but clear differences in the structure of the genitalia.

Distribution. This trans-Palearctic temperate species has hitherto been reported from E- and S-Kazakhstan [Tarabaev, 1979; Savelieva, 1970, 1979, 1990] and Azerbaijan [Dunin, 1979]. All localities of *H. dubius* in Middle Asia and in the Caucasus are shown in Fig. 9.

Habitat. In Georgia, *H. dubius* has been collected in the litter of a mixed coniferous-broadleaved (*Abies*, *Pinus*, *Fagus*, *Acer*) forest.

Description. MALE. Measurements. Carapace 1.74 long, 1.20 wide, 0.70 high at PLE. Ocular area 0.60 long, 0.85 wide anteriorly and 0.94 wide posteriorly. Diameter of AME 0.35. Abdomen 1.74 long, 0.70 wide. Cheliceral length 0.41. Length of leg segments: leg I: 0.80 + 0.38 + 0.51 + 0.45 + 0.20; leg II: 0.75 + 0.35 + 0.38 + 0.41 + 0.41; leg III: 0.75 + 0.20 + 0.45 + 0.45 + 0.38; leg IV: 1.07 + 0.42 + 0.75 + 0.75 + 0.50. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.2-2; Mt v.2-2. Leg II: Fm d.1-1-1; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb



Figs 48-50. *Heliophanus dubius* C. L. Koch, 1835: 48 — epigyne; 49 — spermathecae, dorsal view; 50 — ditto, rear view. Scale: 0.14 mm.
Рис. 48-50. *Heliophanus dubius* C. L. Koch, 1835: 48 — эпигина; 49 — сперматека; 50 — то же, вид сзади. Масштаб: 0,14 мм.

pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1, pr.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.1-2ap., pr. and rt.1ap., v.1-2ap. Coloration grey to brown, being typical for *Heliophanus*. Legs brown with yellow tarsi. Palpal structure as in Figs 43-47.

FEMALE (from Tomsk). Measurements. Carapace 1.95 long, 1.59 wide, 0.67 high at PLE. Ocular area 0.65 long, 1.06 wide anteriorly and 1.13 wide posteriorly. Diameter of AME 0.37. Abdomen 5.50 long, 1.18 wide. Cheliceral length 0.53. Length of leg segments: leg I: 0.89 + 0.58 + 0.62 + 0.50 + 0.45; leg II: 0.75 + 0.63 + 0.58 + 0.47 + 0.38; leg III: 0.89 + 0.50 + 0.58 + 0.75 + 0.20; leg IV: 1.06 + 0.50 + 0.87 + 0.87 + 0.50. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.1-1; Mt v.2-2. Leg II: Fm d.1-1-1; Tb pr.0-1, v.1-0; Mt v.2-2ap. Leg III: Fm d.1-1-1; Tb rt.0-1, pr.1-1; Mt 5ap. Leg IV: Fm d.1-1-1; Tb pr.0-1, v.1ap.; Mt d.2-2ap., pr. and rt.1ap., v.2ap. Coloration as in ♂, but legs yellow with dorsolateral longitudinal brown lines, and dorsum bordered by a white line anteriorly and on sides. Epigyne and spermathecae as in Figs 48-50.

Heliophanus dunini sp.n.

Figs 51-54, 59-60, 61

H. kochi: Pavlenko 1985: 149; Zyuzin et al., 1994: 7; Dunin, 1979: 39 (in part); 1984: 58 (in part); Dunin & Mamedov, 1992: 57; all records non Simon, 1868.

Material. Holotype: 1 ♂ (ISE), AZERBAIJAN, Baku, Yasamal-skaya Dolina, 1-4.05.1977, P.D.

Paratypes: AZERBAIJAN: 3 ♂♂, 12 ♀♀ (ISE), 2 ♂, 7 ♀ (ZMMU), together with holotype; 2 ♂♂, 1 ♀ (ZMMU), same locality, 16.05.1978, P.D.; 1 ♀ (ZMMU), same locality, 20.04.1988, P.D.; 1 ♀ (ZMMU), same locality, 18.05.1976, P.D.; 1 ♀ (ISE), same locality, 5.07.1989, P.D.; 1 ♂ (ISE), same locality, 17.10.1987, P.D.; 1 ♂ (ZMMU), Baku, Mardakian, 20.05.1984, P.D.; 1 ♂, 1 ♀ (ISE), Lerik Distr., Zuvand, Gosmalian, 1400 m alt., 18.05-28.06.1985, P.D.; 1 ♂ (ISE), same distr., Zuvand, Raghef, 2300 m alt., 30.06.1985, P.D.; 1 ♂ (ISE), Salyany Distr., Enikend, 20.05.1985, P.D. — KAZAKHSTAN: 1 ♀ (ZISP), Aral Sea, Barsakelmes Island,

8.05.1981, T.V. Pavlenko; 1 ♀ (ZISP), same locality, 3.09.1981, V.V. Shishkina; 1 ♂ (ZISP), same locality, 22.04.1982, D.D. Piriulin.

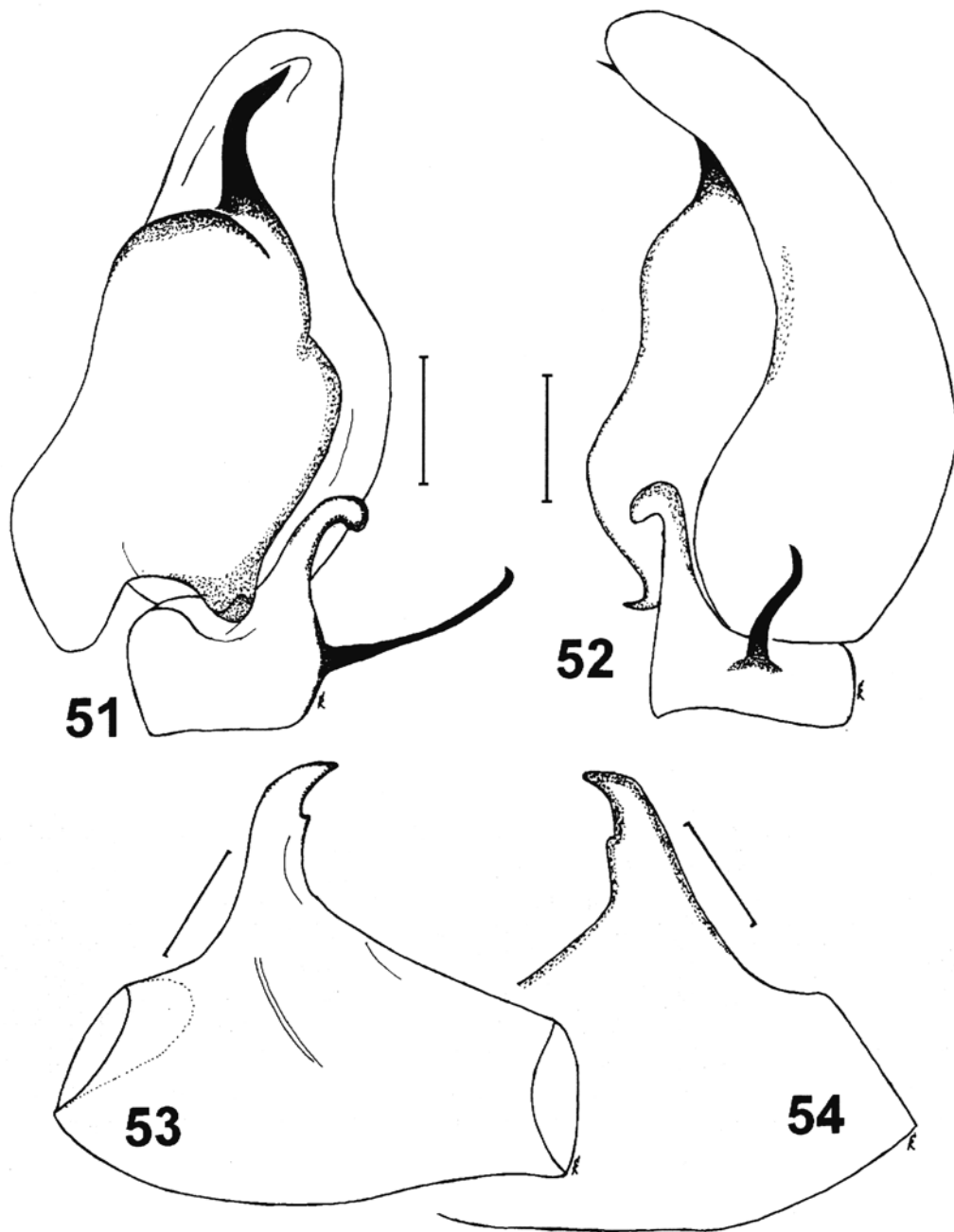
Comparative material of *H. kochi* Simon, 1868 (Figs 33-34): 7 ♂♂, 2 ♀♀ (ISE), CRIMEA, Bakhchisaray, 5-26.06.1993, S.V. Vasilenko.

Diagnosis. *H. dunini* is closest to *H. cupreus*, but the ♂ can be distinguished by the longer, spiniform tibial apophysis (Figs 51-52) and notched femoral process (Figs 53-54); the ♀ differs in the structure of both epigyne (Figs 29) and spermathecae (Figs 59-60). Also, the ♀ of *H. dunini* can be mistaken for that of *H. lineiventris* and *H. kochi*, the most reliable distinctive characters being observed in the spermathecae only (cf. Figs 57-58 and 33-34).

Distribution. The species is currently known from Azerbaijan and Barsakelmes Island only (Fig. 61). It has hitherto been reported from there sub *H. kochi* [Pavlenko, 1985; Dunin, 1979, 1984; Zyuzin et al., 1994].

Description. **MALE.** Carapace 2.50 long, 1.70 wide and 1.00 high at PLE. Abdomen 2.50 long, 1.74 wide. Cheliceral length 0.85. Ocular area 0.75 long, 1.20 wide anteriorly and 1.35 wide posteriorly. Diameter of AME 0.20. Length of leg segments: leg I: 1.38 + 0.75 + 1.00 + 0.75 + 0.62; leg II: 1.00 + 0.62 + 0.75 + 0.50 + 0.50; leg III: 1.00 + 0.50 + 0.68 + 0.62 + 0.60; leg IV: 1.25 + 0.62 + 0.87 + 0.87 + 0.70. Leg spination. Leg I: Fm d.1-1-1ap, pr.1ap.; Tb pr.0-1, v.2-2-2ap.; Mt v.2-2ap. Leg II: Fm d.1-1-1ap., pr.1ap.; Tb pr.0-1, v.1-1-2ap.; Mt v.2-2ap. Leg III: Fm d.1-1-1ap, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt pr.1-2ap., v.1-2ap. Leg IV: Fm d.1-1-1, pr. and rt.1ap.; Tb pr. and rt.1-1-1, v.1-1ap.; Mt d.2-2ap, pr. and rt.1ap., v.2ap. Coloration. Carapace dark brown. Eye field black. Sternum and labium brown. Maxillae light brown. Abdomen grey. Dorsum with five white spots, venter with a pair of white spots in front of spinnerets. Leg I brown, legs II-IV yellow. Palps and legs I-II except for femora covered with white scales. Palpal structure as in Figs 52-54.

FEMALE. Carapace 2.30 long, 1.59 wide and 1.00



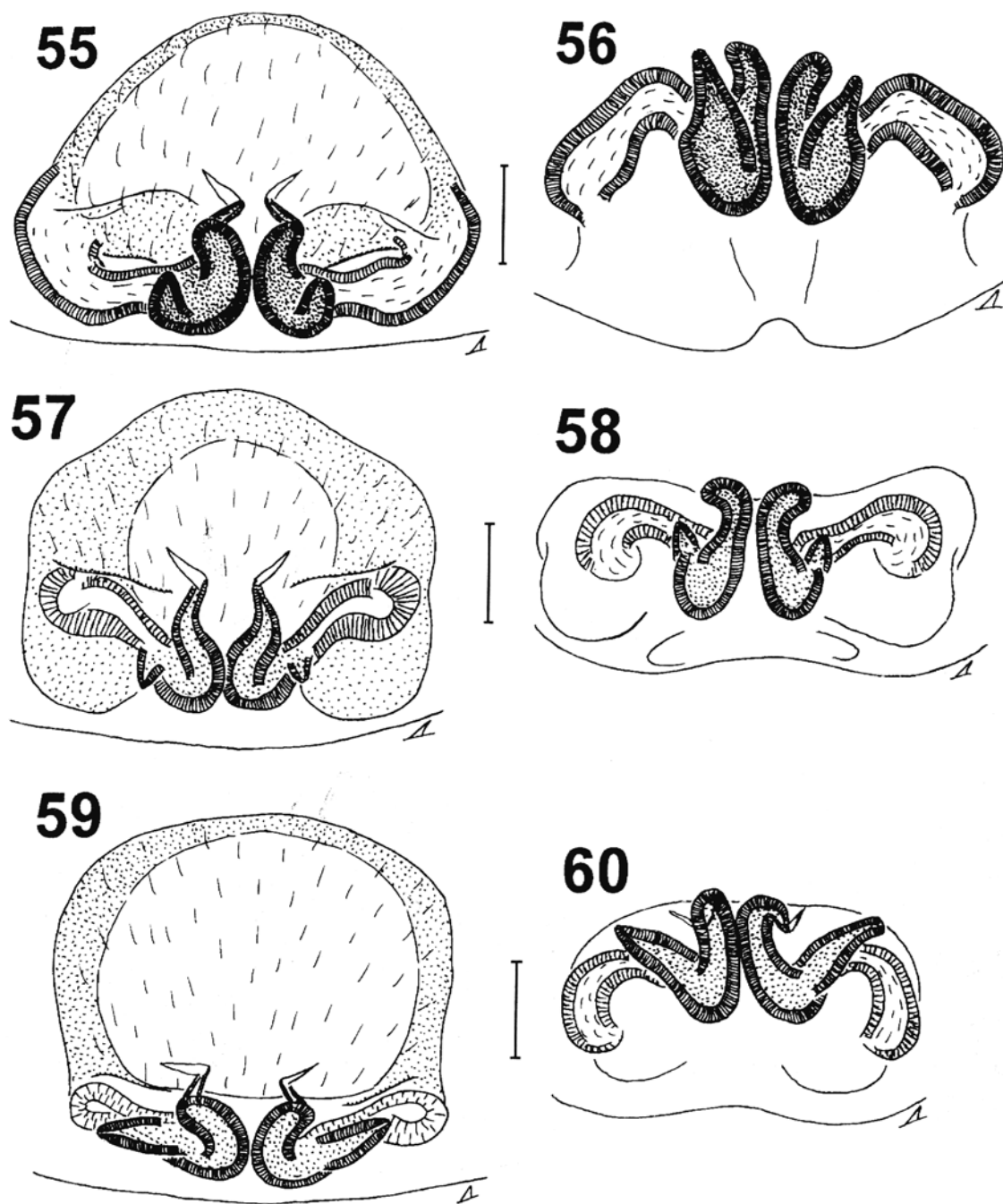
Figs 51-54. *Heliophanus dunini* sp.n.: 51 — ♂ palp, ventral view; 52 — ditto, lateral view; 53 — palpal femur, median view; 54 — ditto, lateral view. Scale: 0.14 mm.

Рис. 51-54. *Heliophanus dunini* sp.n.: 51 — палепа самца, вентрально; 52 — то же, латерально; 53 — бедро палепы, медиально; 54 — то же, латерально. Масштаб: 0,14 мм.

high at PLE. Abdomen 2.50 long, 1.49 wide. Cheliceral length 0.75. Ocular area 0.87 long, 1.38 wide anteriorly and 1.50 wide posteriorly. Diameter of AME 0.38. Length of leg segments: leg I: $1.25 + 0.62 + 0.81 + 0.60 + 0.58$; leg II: $1.13 + 0.62 + 0.69 + 0.54 + 0.50$; leg III: $1.20 + 0.50 + 0.62 + 0.63 + 0.62$; leg IV: $1.36 + 0.62 + 1.00 + 1.06 + 0.68$. Leg spination. Leg I: Fm d.1-1-1ap., pr.1ap.; Tb v.2-2-1ap.; Mt v.2-2ap. Leg II: Fm d.1-1-1ap., pr.1ap.; Tb pr.0-0-1, v.1-1-2ap.; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.2-3ap. Leg IV: Fm d.1-

1-1, pr.1ap.; Tb pr.1-1-1, v.1-2ap.; Mt d.2-2-2ap., pr.1-1-1ap., v.1-2ap. Coloration as in ♂, but dorsum gray with a single anterior white spot, and venter with a pair of longitudinal white lines gathering together near spinnerets. Epigyne and spermathecae as in Figs 29, 59-60.

Name. The species is named after the well-known Russian arachnologist and our friend, Dr. Peter M. Dunin (Russia, Togliatti), who, for many years, has studied the spider fauna of Azerbaijan and eventually collected the bulk of the type series.



Figs 55-60. Spermathecae of *H. turanicus* Charitonov, 1969 (55-56), *H. lineiventris* Simon, 1868 (57-58) and *H. dunini* sp.n. (59-60): 55, 57, 59 — dorsal view; 56, 58, 60 — rear view. Scale: 0.1 mm.

Рис. 55-60. Сперматеки *H. turanicus* Charitonov, 1969 (55-56), *H. lineiventris* Simon, 1868 (57-58) и *H. dunini* sp.n. (59-60): 55, 57, 59 — вид дорзально; 56, 58, 60 — вид сзади. Масштаб: 0,1 мм.

Heliophanus equester L. Koch, 1867
Figs 35, 62-65.

H. e.: Kharitonov, 1932: 179; Nenilin, 1985: 130; Prószyński, 1976: map 80; Wesolowska, 1986: 213-214, figs 652-660, 901.

H. simplex: Dunin & Mamedov, 1992: 57 (♂), non Simon, 1868.

Material. AZERBAIJAN: 1 ♂, 2 ♀♀ (ISE), Saatly Distr.,

Dzhafarkhan, 30.05.1978, P.D.; 1 ♀ (ZMMU), same locality, 15.06.1982, P.D.; 1 ♀ (ZMMU), same locality, 10.06.1977, P.D.; 2 ♀♀ (ISE), Baku, Yasamalskaya Dolina, 14.06.1981, P.D.

Diagnosis. Easily separable from other *Heliophanus* species by the very long, curved embolus (Fig. 62), as well as by the uncommon ♀ genitalia which are similar to those of the members of the so-called *Icius-Pseudicius* complex (Figs 64-66).

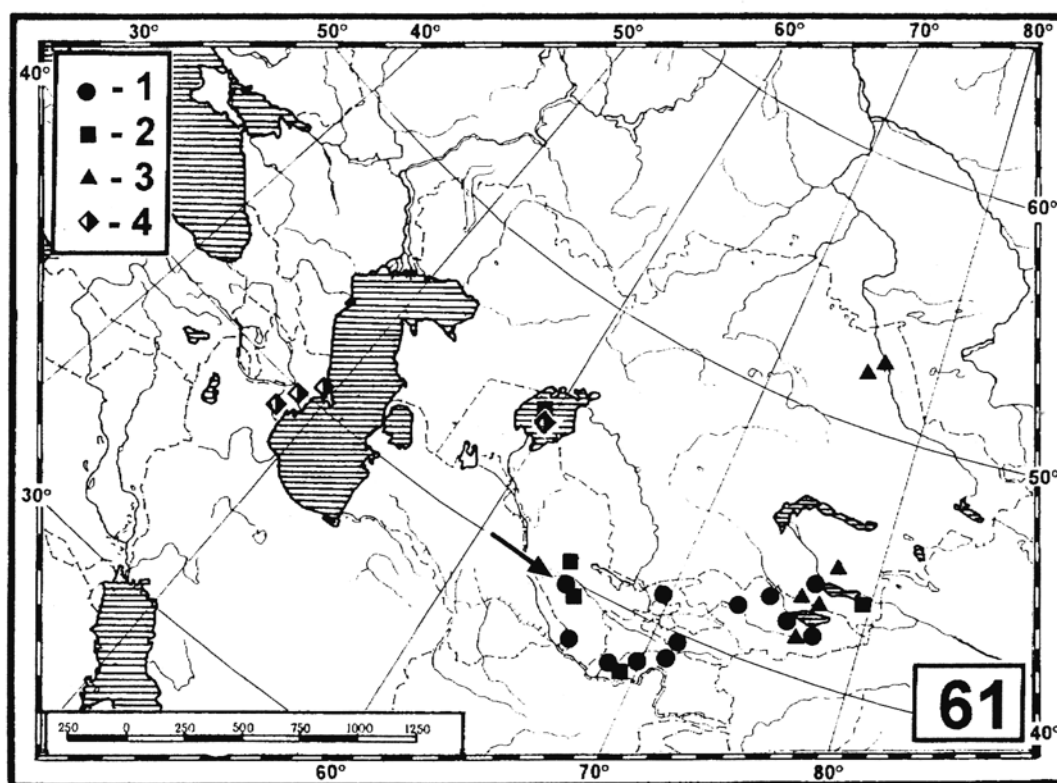


Fig. 61. Localities of *H. potanini* (1), *H. forcipifer* (2), *H. patagiatus* (3) and *H. dunini* (4) in the Caucasus and in Middle Asia. Locality of the ♂ disjunct of *H. potanini* with a broadened tip of the embolus arrowed.

Рис. 61. Местонахождения *H. potanini* (1), *H. forcipifer* (2), *H. patagiatus* (3) и *H. dunini* (4) на Кавказе и в Средней Азии. Местонахождение уклоняющегося самца *H. potanini* с расширенным концом эмболюса помечено стрелкой.

Distribution. The species has hitherto been known from S-Europe only [s. Wesołowska, 1986: fig. 901]. E-Azerbaijan is thus the easternmost locality for *H. equester* (Fig. 35). All localities of *H. equester* in the Caucasus, including the data presented by Kulczyński [1895] and Wesołowska [1986], are shown in Fig. 35.

Description. MALE. Carapace 2.25 long, 1.62 wide and 0.85 high at PLE. Abdomen 2.15 long, 1.55 wide. Cheliceral length 0.54. Ocular area 0.63 long, 1.25 wide anteriorly and 1.25 wide posteriorly. Diameter of AME 0.45. Length of leg segments: leg I: 1.00 + 0.68 + 0.80 + 0.62 + 0.50; leg II: 0.87 + 0.59 + 0.62 + 0.58 + 0.42; leg III: 1.00 + 0.53 + 0.62 + 0.87 + 0.62; leg IV: 1.06 + 0.50 + 0.81 + 1.00 + 0.50. Leg spination. Leg I: Fm d.1-1-1ap.; Tb pr.0-1, v.2-2ap.; Mt v.2-2ap. Leg II: Fm d.1-1-1ap.; Tb pr.0-1, v.1-1ap.; Mt v.2-2ap. Leg III: Fm d.1-1-1ap.; Tb pr. and rt.1-1, v. 2ap.; Mt d.1-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1, rt.1ap; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.0-2-2ap, pr. and rt.1ap., v.2ap. Coloration. Carapace dark brown. Eye field black. Sternum, maxillae, chelicerae and labium brown. Abdomen grey. Venter with a pair of white spots in front of spinnerets. Leg I dark brown, legs II-IV brown. All legs with prolateral, longitudinal yellow lines covered with white scales. Palpal structure as in Figs 62-63.

FEMALE. Carapace 2.25 long, 0.94 wide and 1.00 high at PLE. Abdomen 3.75 long, 2.50 wide. Cheliceral length 0.54. Ocular area 0.80 long, 1.25 wide anteriorly and 1.25 wide posteriorly. Diameter of AME 0.45. Length of leg segments: leg I: 1.00 + 0.62 + 0.75 + 0.62 + 0.50;

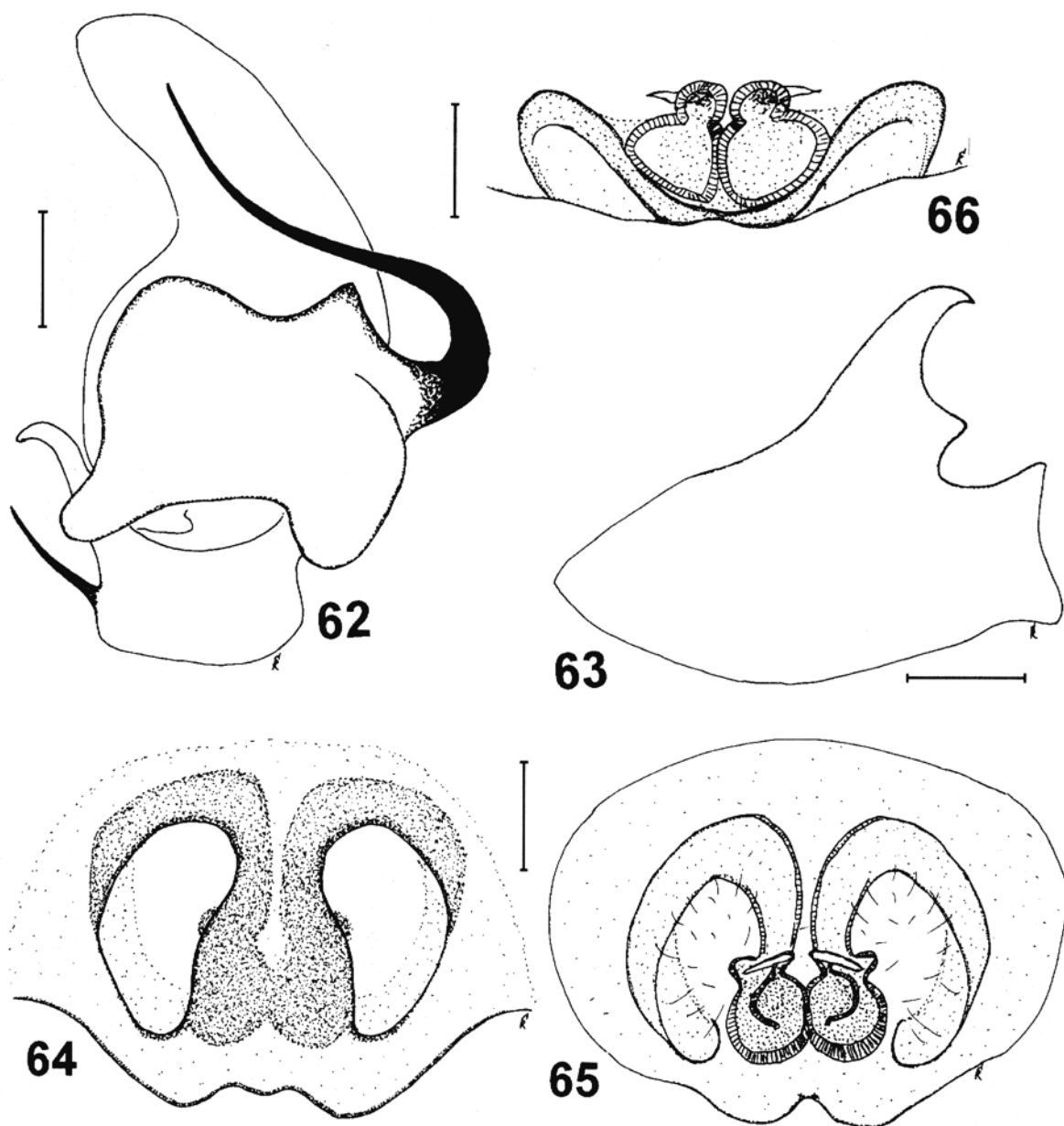
leg II: 0.87 + 0.50 + 0.62 + 0.53 + 0.50; leg III: 1.00 + 0.62 + 0.75 + 0.87 + 0.62; leg IV: 1.20 + 0.62 + 1.00 + 1.15 + 0.50. Leg spination. Leg I: Fm d.1-1-1ap.; Tb v.2-2-1ap.; Mt v.2-2ap. Leg II: Fm d.1-1-1ap., pr.1ap.; Tb pr.0-1, v.1-1-1ap.; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap.; Leg IV: Fm d.1-1-1; Tb pr. and rt.1-1-1, v.1-2ap.; Mt d.2-2-2ap., pr. and rt.1ap., v.1-2ap. Coloration as in ♂, but carapace brown, with orange sides; maxillae yellow; dorsum grey with a pair of longitudinal parallel white lines in its back part; venter yellow. Epigyne and spermathecae as in Figs 64-66.

Heliophanus flavipes Hahn, 1831 Figs 67-75.

H. f.: Nenilin, 1984a: 18; 1984b: 136; 1985: 130; Yakhontov, 1955: 362; Fet, 1983: 842; Savclieva, 1990: 173; Mikhailov & Fet, 1994: 517; Ovtsharenko, 1978: 683; Dunin, 1989: 38; Dunin & Mamedov, 1992: 57; Prószyński, 1976: map 75; Kharitonov, 1932: 179.

H. varians: Savclieva, 1990: 173.

Material. KABARDINO-BALKARIA: 1 ♂ (ZISP), Cheget Mt., 2200 m alt., 3.07.1976, V.O. — NORTH OSSETIA: 1 ♂ (ZMMU), Buron, Canyon Kasarskoye, Uiltsa, 18.06.1981, S.K. Alekseev. — KRASNODAR PROVINCE: 3 ♀♀ (ZISP), Caucasian State Reserve, Guzeripl, 650 m alt., 12.07.1974, V.O.; 1 ♂ (ZISP), same locality, 18.06.1976, V.O.; 1 ♀ (ZISP), Khosta, 17.06.1975, V.O.; 2 ♀♀ (ZISP), Maikop, 9.06.1976, V.O. — AZERBAIJAN: 2 ♂♂, 20 ♀♀ (ISE), 1 ♀ (ZMMU), 20-25 km NE of Shemakha, Pirkuli Reserve, 1100-1800 m alt., 23.05-4.06.1984, D.L.; 3 ♂♂, 3 ♀♀

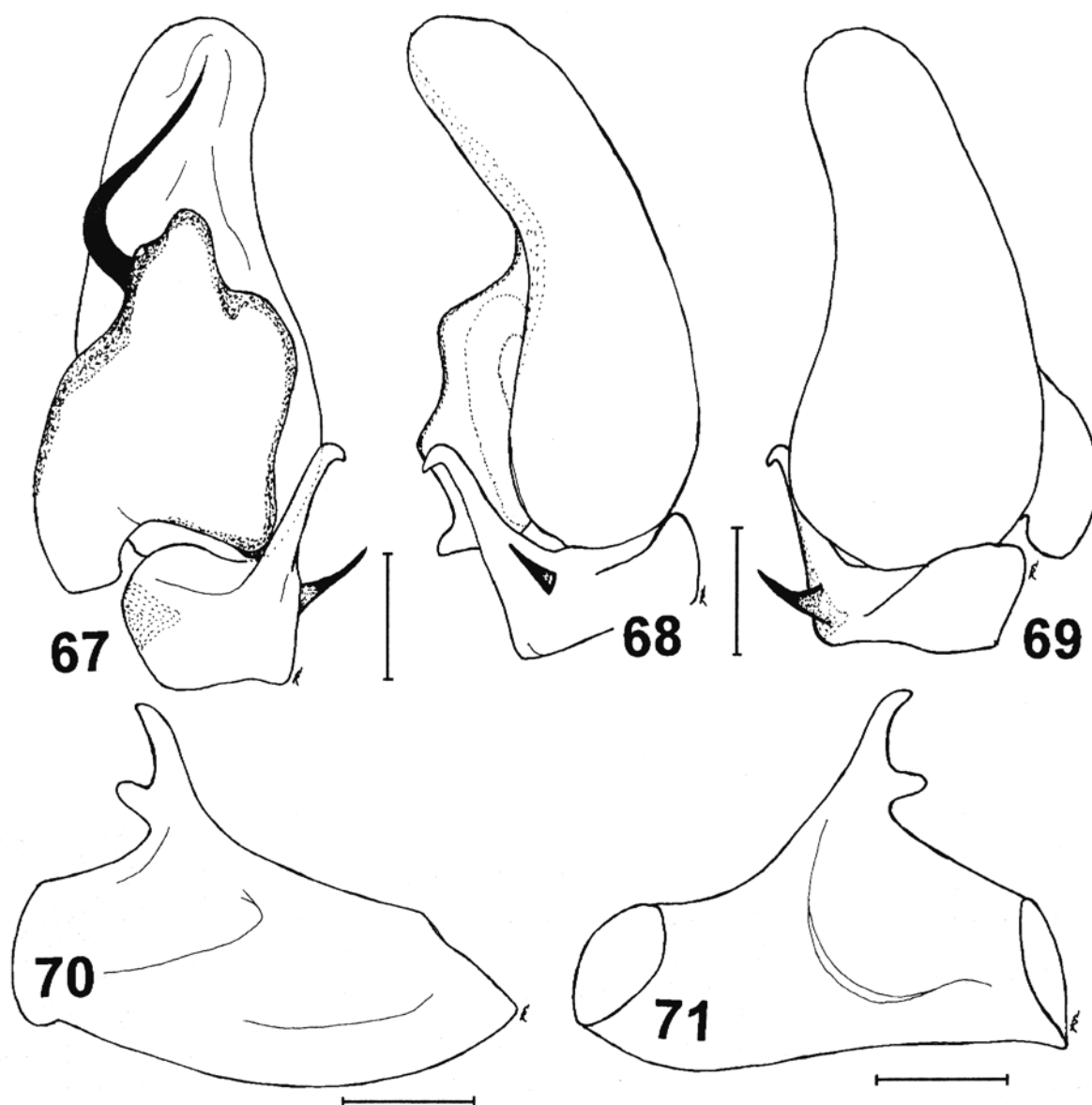


Figs 62-66. *Heliophanus equester* L. Koch, 1867: 62 — ♂ palp, ventral view; 63 — palpal femur, lateral view; 64 — epigyne; 65 — spermathecae, dorsal view; 66 — ditto, rear view. Scale: 0.14 mm.

Рис. 62-66. *Heliophanus equester* L. Koch, 1867: 62 — палепа ♂, вентрально; 63 — бедро пальпы, латерально; 64 — эпигина; 65 — сперматека, вид дорзально; 66 — то же, вид сзади. Масштаб: 0,14 мм.

(ZMMU), Talysh Mts., Lerik, 1400-1700 m alt., 1.07-14.09.1985, P.D.; 1 ♀ (ZMMU), same locality, 10.10.1983, S. Golovatch; 1 ♀ (ISE), Lerik Distr., Zuvand, Divagach, 1300 m alt., 18.07.1983, S. Dashdamirov; 2 ♂♂, 3 ♀♀ (ISE), Lenkoran Distr., Kirovsk, 8.05.1985, P.D. — KYRGHYZSTAN: 1 ♂, 3 ♀♀ (ISE), Issyk-Kul Area, Chon-Uryukty River, 1700-2500 m alt., 24.05.1993, D.M.; 2 ♂♂, 3 ♀♀ (ISE), same area, Teploklyuchenka, 19.05.1993, D.M.; 1 ♂ (ZISP), Tyup Distr., Santash, 10.07.1985, S.O.; 1 ♀ (ISE), Lake Issyk-Kul, near Dzhety-Oguz, 42°18'N, 78°18'E, 6-9.07.1994, D.M.; 1 ♂ (ISE), 40 km NNW of Bishkek, Kamyshovka, Chu River, 7.05.1985, S.O.; 2 ♂♂, 3 ♀♀ (ZMMU), same locality, summer 1980, S.Z.; 1 ♂ (ZISP), Kuturga, 19.07.1977, S.Z.; 1 ♂ (ISE), Dzhanghi-Pakhta, 10.06.1986, S.O. — KAZAKHSTAN: 1 ♀ (ZISP), Akmolinsk, Lake Kurshaldzin, 06.1929, S. Spassky; 2 ♀♀

(ISE), Pavlodar Area, 25 km N of Pavlodar, Irtysh River Valley, 8.09.1992, O.L.; 1 ♂, 1 ♀ (ISE), same area, Ekibastuz Distr., 5 km SE of Shiderty, 1.08.1992, O.L.; 2 ♂♂, 1 ♀ (ISE), same area, Bairam-Aul Distr., Kyzyl-Tau, 12.06.1991, O.L.; 1 ♂ (SVO), Almaty Area, Zailiiskii Alatau Mt. Range, Bolshaya Almatinka River, 6.07.1993, S.O.; 1 ♀ (ZMMU), S-Kazakhstan Area, Arys, date and collector unknown. — TURKMENISTAN: 1 ♂ (ZISP), SW-Kopetdagh, Aidere, 10.85.1979, V.Y. Fet; 1 ♀ (ZMMU), same locality, 26.04.1989, K.G. Mikhailov; 1 ♀ (ISE), Firyuza, 24.04.1994, V.D. — UZBEKISTAN: 1 ♂ (ZISP), Tashkent Area, Ordzhonikidze Distr., Svobodnyi, 02.1979, A.B. Nenilin; 1 ♀ (ZMMU), 40 km SW of Tashkent, Gulbator, 30.04.1986, S. Kurbatov; 1 ♂, 1 ♀ (ISE), 7-9 km N of Kitab, Zeravshanskii Mt. Range, Pass Aman-Kutan, 5.05.1995, S.O.; 2 ♀♀ (PSU), Termez, summer 1933, M.N.



Figs 67-71. *Heliophanus flavipes* Hahn, 1831: 67 — ♂ palp, ventral view; 68 — ditto, lateral view; 69 — ditto, dorsal view; 70 — palpal femur, lateral view; 71 — ditto, median view. Scale: 0.14 mm.

Рис. 67-71. *Heliophanus flavipes* Hahn, 1831: 67 — палепа самца, вентрально; 68 — то же, латерально; 69 — то же, вид дорзально; 70 — бедро палепы, латерально; 71 — то же, медиально. Масштаб: 0,14 мм.

Danilova. — UNCERTAIN LOCALITIES: 1 ♀ (ZISP), Turkestan, Moiram-Kul, 18.08.1907, N.D. Zarudny.

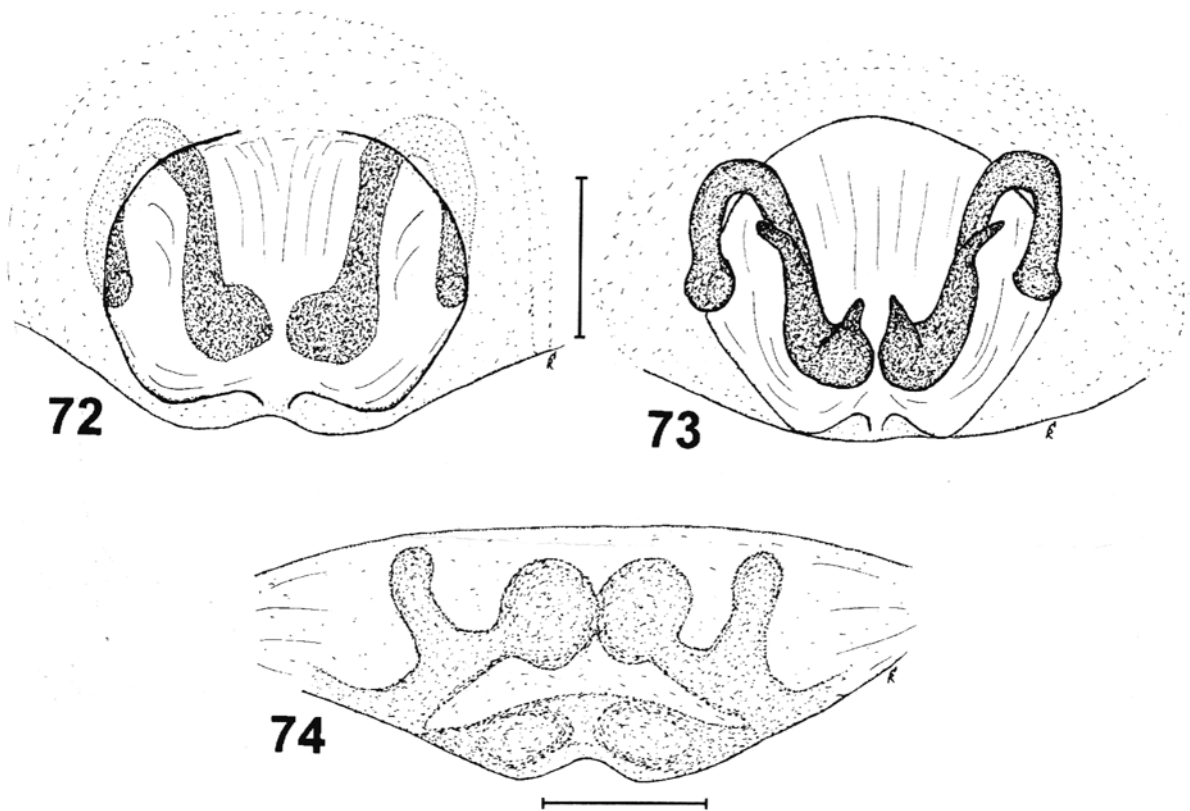
Diagnosis. See comments in "Diagnosis" under *H. auratus* and *H. mordax*.

Distribution. This Euro-Siberian temperate species has hitherto been reported from Kyrgyzstan: Osh [Kroneberg, 1875], Lake Issyk-Kul, environs of Bishkek (Kuturga and Chu rivers) and Ferganskii Mt. Range (Kara-Alma) [Nenilin, 1984b]; E-Kazakhstan [Savelieva, 1990]; Turkmenistan: SW-Kopetdagh [Fet, 1983; Nenilin, 1984a; Mikhailov & Fet, 1994]; Uzbekistan: Tashkent, Samarkand Area (Agalyk, Khodzhaduk) and Zeravshanskii Mt. Range [Kroneberg, 1875; Kharitonov, 1932; Yakhontov, 1955; Alimdzhанov & Bronshtein, 1956; Bronshtein & Murtazaev, 1974; Nenilin, 1984a];

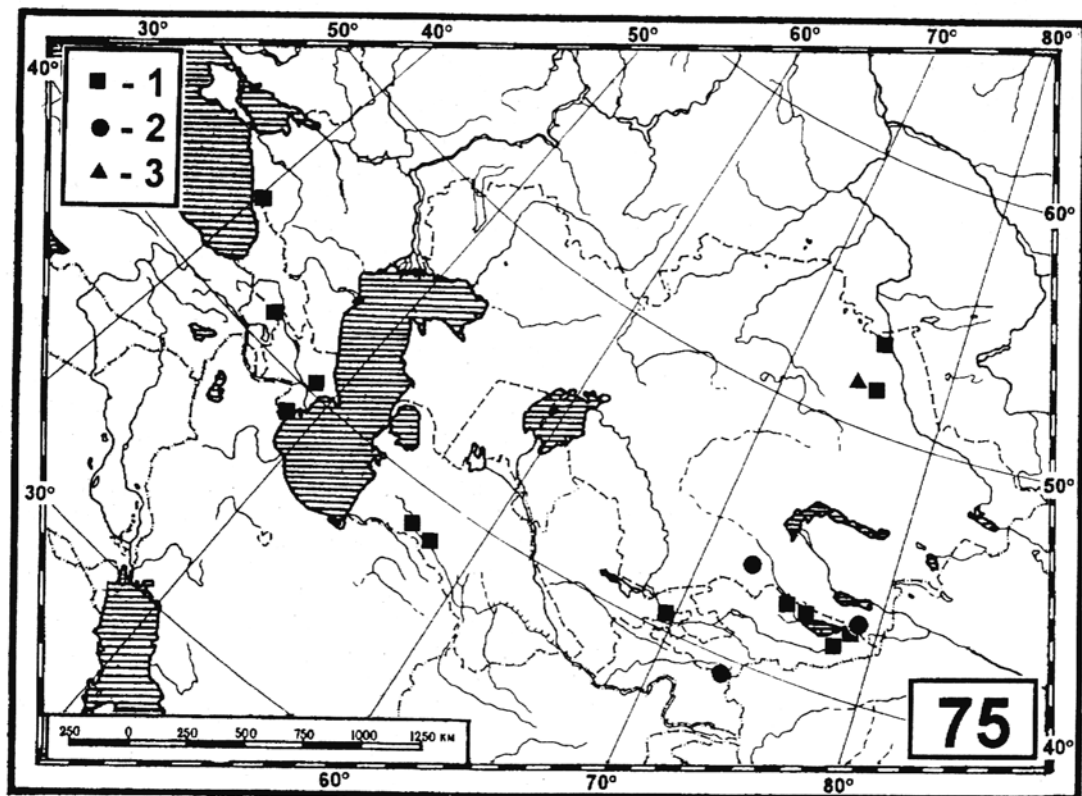
and the Caucasus (Black Sea coast) [Ovtsharenko, 1978]. All localities of *H. flavipes* in Middle Asia and the Caucasus are shown in Fig. 75.

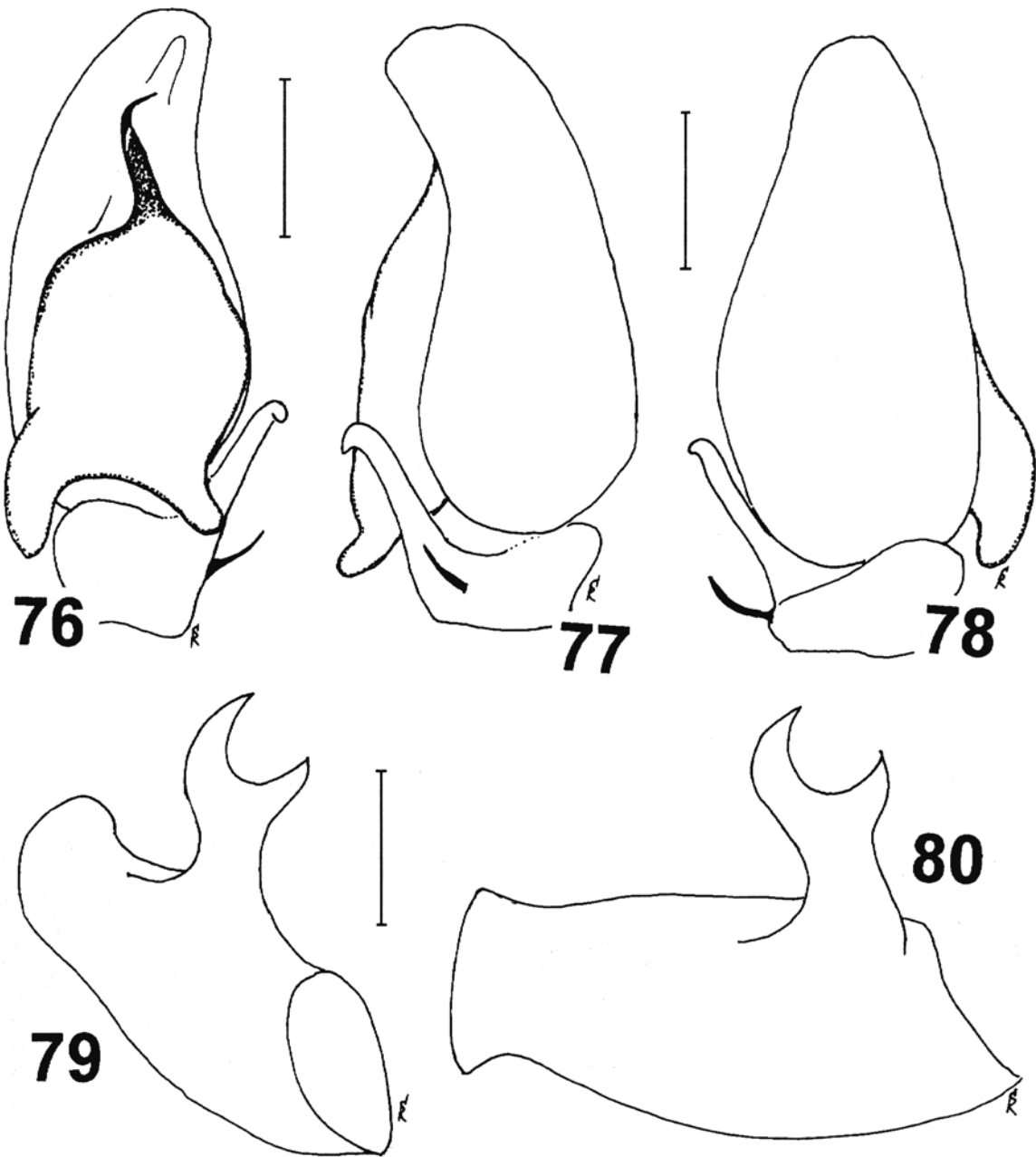
Habitat. In the Caucasus, the species has been collected in *Populus* and *Salix* forests along streams, in the litter and under stones.

Description. MALE. Measurements. Carapace 1.60-2.00 long, 1.20-1.50 wide, 0.75-1.14 high at PLE. Ocular area 0.65-0.88 long, 0.90-1.14 wide anteriorly and 1.00-1.25 wide posteriorly. Diameter of AME 0.30-0.38. Abdomen 1.44-2.25 long, 1.14-1.62 wide. Cheliceral length 0.62-0.71. Length of leg segments: leg I: 0.75-1.00 + 0.25-0.62 + 0.58-0.87 + 0.42-0.58 + 0.40-0.54; leg II: 0.62-0.87 + 0.38-0.56 + 0.42-0.60 + 0.50-0.58 + 0.48-0.50; leg III: 0.70-0.90 + 0.41-0.50 + 0.48-0.62 + 0.50-0.68 +



Figs 72-74. *Heliophanus flavipes* Hahn, 1831: 72 — epigyne; 73 — spermathecae, dorsal view; 74 — ditto, rear view. Scale: 0.14 mm.
 Рис. 72-74. *Heliophanus flavipes* Hahn, 1831: 72 — эпигина; 73 — сперматека; 74 — то же, вид сзади. Масштаб: 0,14 мм.





Figs 76-80. *Heliophanus forcipifer* Kulczyński, 1895: 76 — ♂ palp, ventral view; 77 — ditto, lateral view; 78 — ditto, dorsal view; 79 — palpal femur, prolateral view; 80 — ditto, lateral view. Scale: 0.14 mm.

Рис. 76-80. *Heliophanus forcipifer* Kulczyński, 1895: 76 — палепа ♂, вентрально; 77 — то же, латерально; 78 — то же, вид дорзально; 79 — бедро палепы, пролатерально; 80 — то же, латерально. Масштаб: 0,14 мм.

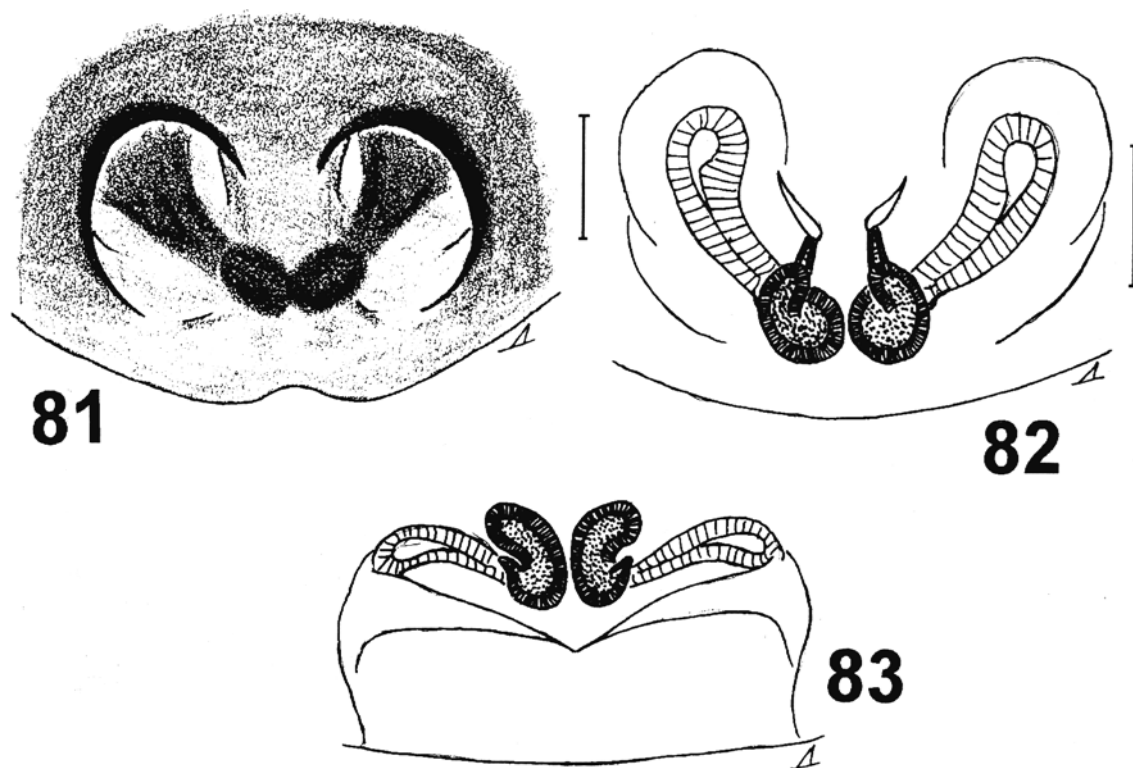
0.38-0.50; leg IV: 0.87-1.13 + 0.38-0.50 + 0.62-0.65 + 0.62-0.75 + 0.38-0.62. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.2-2; Mt v.2-2ap. Leg II: Fm d.1-1-1; pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.1-2-2ap., pr. and rt.1ap.,

v.1-2ap. Coloration typical for *Heliophanus*. Legs yellow with prolateral longitudinal brown lines. Dorsum with an anterior white spot. Palpal structure as in Figs 67-71.

FEMALE. Measurements. Carapace 1.99 long, 1.29 wide, 0.85 high at PLE. Ocular area 0.75 long, 1.06 wide anteriorly and 1.20 wide posteriorly. Diameter of AME 0.38. Abdomen 3.00 long, 1.99 wide. Cheliceral length

Fig. 75. Localities of *H. flavipes* (1), *H. wesolowskiae* (2) and *H. koktas* (3) in the Caucasus and in Middle Asia.

Рис. 75. Местонахождения *H. flavipes* (1), *H. wesolowskiae* (2) and *H. koktas* (3) на Кавказе и в Средней Азии.



Figs 81-83. *Heliophanus forcipifer* Kulczyński, 1895: 81 — epigyne; 82 — spermathecae, dorsal view; 83 — ditto, rear view. Scale: 0.1 mm.

Рис. 81-83. *Heliophanus forcipifer* Kulczyński, 1895: 81 — эпигина; 82 — сперматека; 83 — то же, вид сзади. Масштаб: 0,1 мм.

0.75. Length of leg segments: leg I: $0.87 + 0.38 + 0.62 + 0.50 + 0.43$; leg II: $0.80 + 0.48 + 0.51 + 0.45 + 0.42$; leg III: $0.75 + 0.38 + 0.50 + 0.62 + 0.50$; leg IV: $1.13 + 0.50 + 0.87 + 0.87 + 0.62$. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.1-2; Mt v.2-2. Leg II: Fm d.1-1-1; Tb pr.0-1, v.1-1; Mt v.1-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb rt. and pr.1-1, v.1ap.; Mt d.2-2ap., pr. and rt.1ap., v.2ap. Leg IV: Fm d.1-1-1; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.1-2ap., pr. and rt.1ap., v.1-2ap. Coloration as in ♂, but all legs completely yellow. Abdomen with a white line anteriorly and on sides. Venter with a pair of white spots in front of spinnerets. Epigyne and spermathecae as in Figs 72-74.

Heliophanus forcipifer Kulczyński, 1895
Figs 61, 76-83.

H. auratus: Pavlenko, 1985: 150; Zyuzin et al., 1994: 7; (♂, ♀) non C.L. Koch, 1835.

H. pr. auratus Pavlenko, 1985: 150; Zyuzin et al., 1994: 7 (Pavlenko's and Zyuzin's specimens re-examined).

Heliophanus forcipifer: Kharitonov, 1932: 179.

Material. TAJIKISTAN: 1 ♂ (ZMMU), 2 ♂♂ (ISE), Kurgan-Tyube Area, Dzhilikul Distr., Garavuti, 22.04.1986, A.Z. — KAZAKHSTAN: 1 ♂, 1 ♀ (ZISP), Aral Sea, Barsakelmes Island, 25.05.1983, T.V. Pavlenko; 1 ♀ (ZISP), same locality, 3.07.1981, D.O. Eliseev; 1 ♀ (SVO), Canyon Charyn, Sartogai, 12.06.1993, S.O. — UZBEKISTAN: 1 ♀ (ISE), Bukhara, 3.08.1976, A.P. Kononenko; 3 ♂♂, 2 ♀♀ (ISE), Bukhara Area, 20 km S of Kagan, summer 1995, coll. ?; 1 ♀ (SVO), same locality, 19.05.1994, S.O.; 1 ♂ (ZISP), same locality, date and collector unknown; 1 ♀ (ISE), same area, Bukantau Mts., Irlir, 9.05.1976, A.P. Kononenko; 1 ♂ (SVO), S-Uzbekistan, Babatag Mt. Range, Ak-Mechet, 28.04.1995, S. O.; 1 ♀

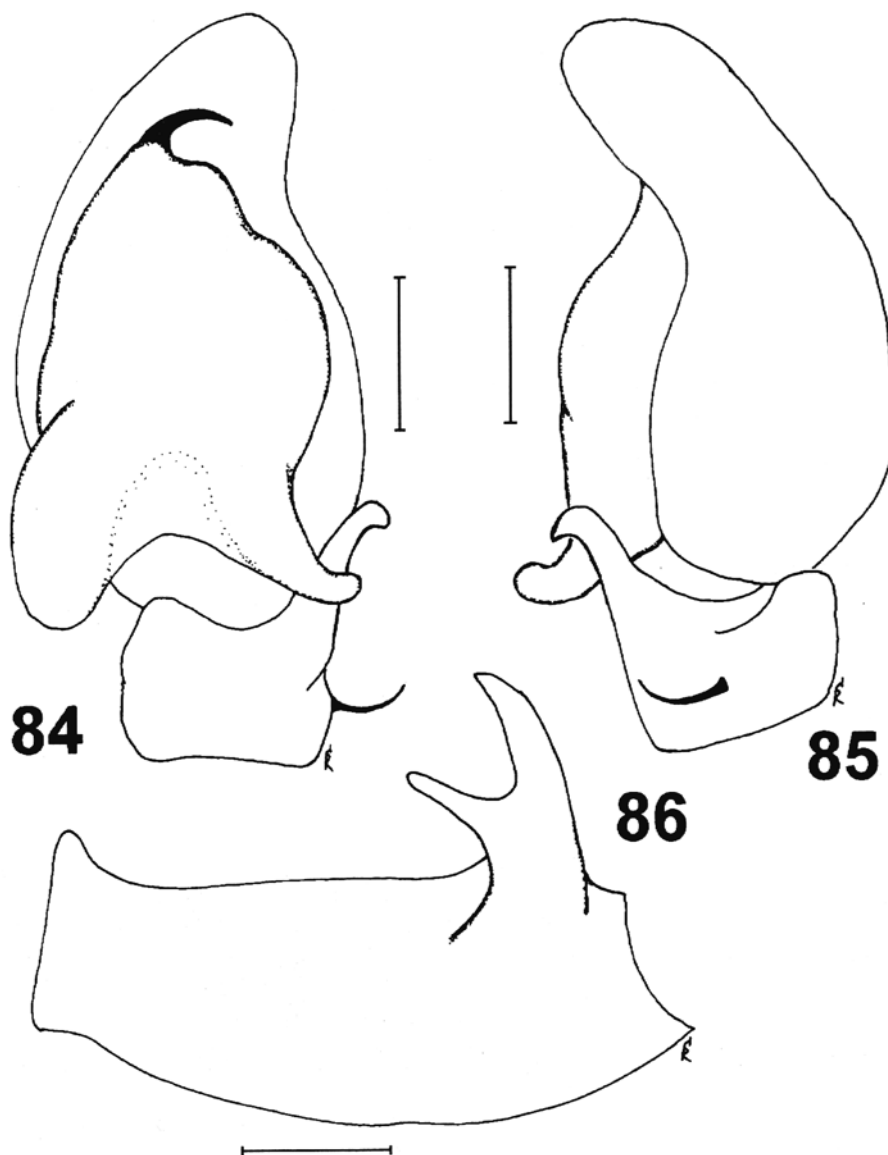
(ISE), S-Uzbekistan, Nuratau Mt. Range, 14.05.1976, A.P. Kononenko. — UNCERTAIN LOCALITY: 1 ♀ (ZISP), 68 km of Nurati [Nurata ?], bank of Syr-Darya River, 12.05.1976, Marchenko.

Diagnosis. The ♂ can easily be separated by the peculiar forceps-shaped femoral process (Figs 79-80). The ♀ of *H. forcipifer*, described herein for the first time, is similar to that of *H. equester*, but differs clearly in the position of the insemination ducts (cf. Figs 82-83).

Distribution. The Caucasus and Middle Asia (Fig. 61). Up to now, *H. forcipifer* has been known from the type locality only (Armenia) [s. Wesolowska, 1986].

Description. MALE. Carapace 1.50 long, 1.07 wide, 0.94 high at PLE. Abdomen 1.75 long, 1.12 wide. Cheliceral length 0.42. Ocular area 0.55 long, 0.87 wide anteriorly and 1.00 wide posteriorly. Diameter of AME 0.35. Length of leg segments: leg I: $0.62 + 0.38 + 0.42 + 0.38 + 0.42$; leg II: $0.54 + 0.38 + 0.38 + 0.30 + 0.42$; leg III: $0.62 + 0.30 + 0.38 + 0.45 + 0.42$; leg IV: $0.88 + 0.40 + 0.54 + 0.53 + 0.42$. Leg spination. Leg I: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg II: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr. and rt.1ap.; Tib. pr.1-1, rt.1-1-1, v.1-2ap.; Mt pr.2ap., rt.1-2ap., v.2ap. Leg IV: Fm d.1-1-1, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2; Mt d.1-2-2ap, pr. 1-1ap., rt.1ap., v.2ap. Coloration. Abdomen dark brown, with a black eye field. Sternum grey. Maxillae and labium brown with yellow tips. Abdomen grey. All leg segments, with the exception of yellow metatarsi and tarsi, dark brown with light lateral longitudinal strips, sparsely covered with white hairs and scales. Palp as in Figs 76-80.

FEMALE. Carapace 1.87 long, 1.36 wide and 0.75



Figs 84-86. *Heliophanus kochi* Simon, 1868: 84 — ♂ palp, ventral view; 85 — ditto, lateral view; 86 — palpal femur, lateral view. Scale: 0.14 mm.

Рис. 84-86. *Heliophanus kochi* Simon, 1868: 84 — палепа ♂, вентрально; 85 — то же, латерально; 86 — бедро палепы, латерально. Масштаб: 0,14 мм.

high at PLE. Abdomen 2.75 long, 2.00 wide. Cheliceral length 0.74. Ocular area 0.62 long, 1.00 wide anteriorly and 1.15 wide posteriorly. Diameter of AME 0.31. Length of leg segments: leg I: $0.87 + 0.42 + 0.50 + 0.42 + 0.47$; leg II: $0.75 + 0.40 + 0.42 + 0.38 + 0.42$; leg III: $1.07 + 0.45 + 0.50 + 0.55 + 0.50$; leg IV: $1.25 + 0.58 + 0.75 + 0.75 + 0.50$. Leg spination. Leg I: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg II: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr. and rt.1-1, v.1-1ap.; Mt d.2-2ap, pr. and rt.1 ap., v.1-2ap. Leg IV: Fm d.1-1-1; Tb pr.1-1, rt.1-1, v.1-2ap.; Mt d.2-2-2ap., pr.1-1-ap., rt.1ap.; v.1-2ap. Coloration as in ♂, but paler. Dorsum with a white irregular colour marking of scales. All legs yellow, but metatarsi and tarsi brownish-yellow. Epigyne and spermathecae as in Figs 81-83.

Heliophanus koktas Logunov, 1992
Figs 75, 87-96.

H. koktas Logunov, 1992: 52-53, fig.1.

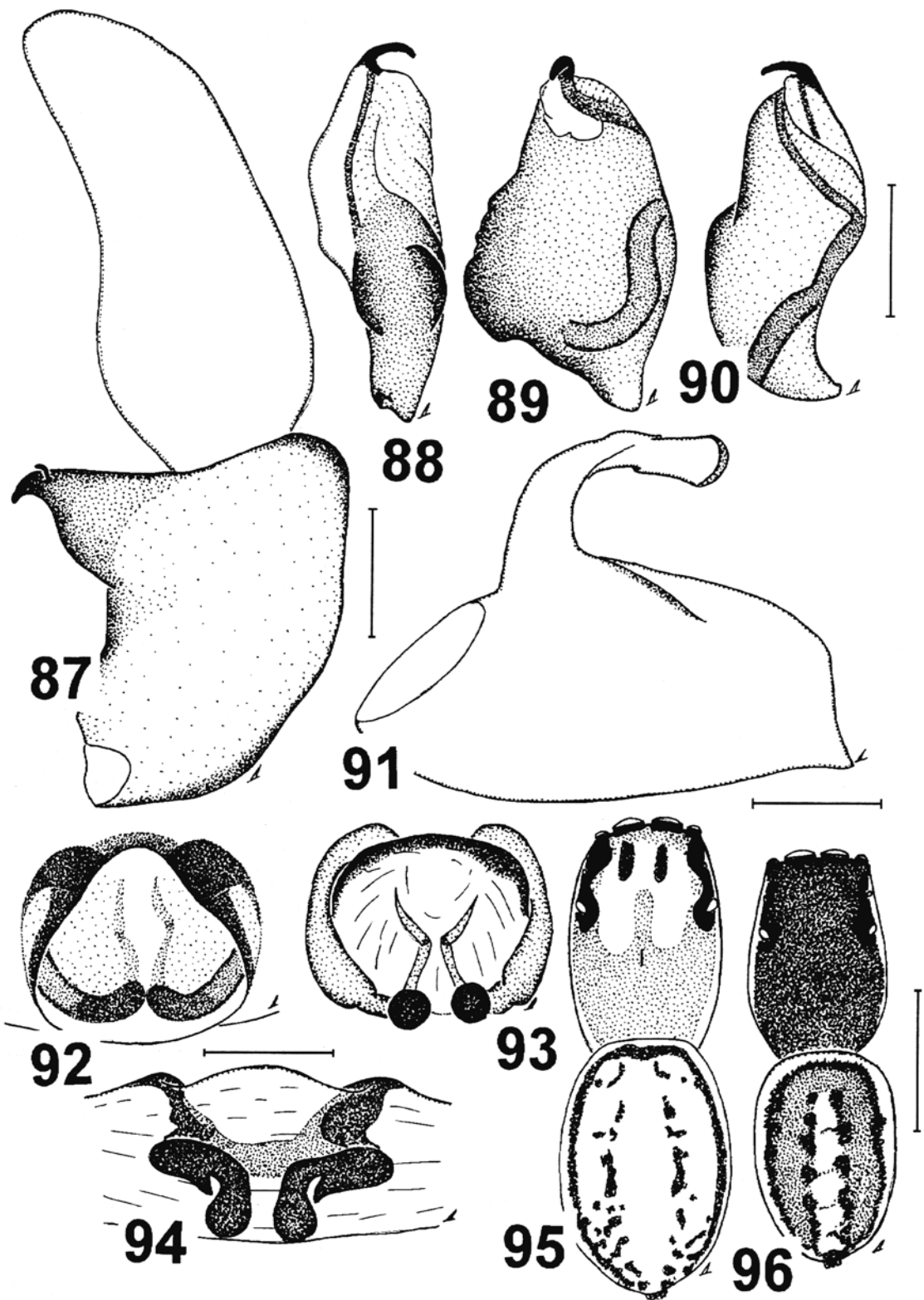
Material. KAZAKHSTAN: 1 ♂ (ISE), Pavlodar Area, Ekibastuz Distr., 6 km SE of Shiderty, 1.08.1992, O.L.

See also Logunov [1992].

Diagnosis. This species is related to the congeners of the *decoratus* species group [sensu Wesołowska, 1986], but can be easily distinguished by the strong recurved femoral process (Fig. 91) and hook-shaped embolus (Figs 88-90), as well as by the unusual, motley, body coloration (Figs 95-96).

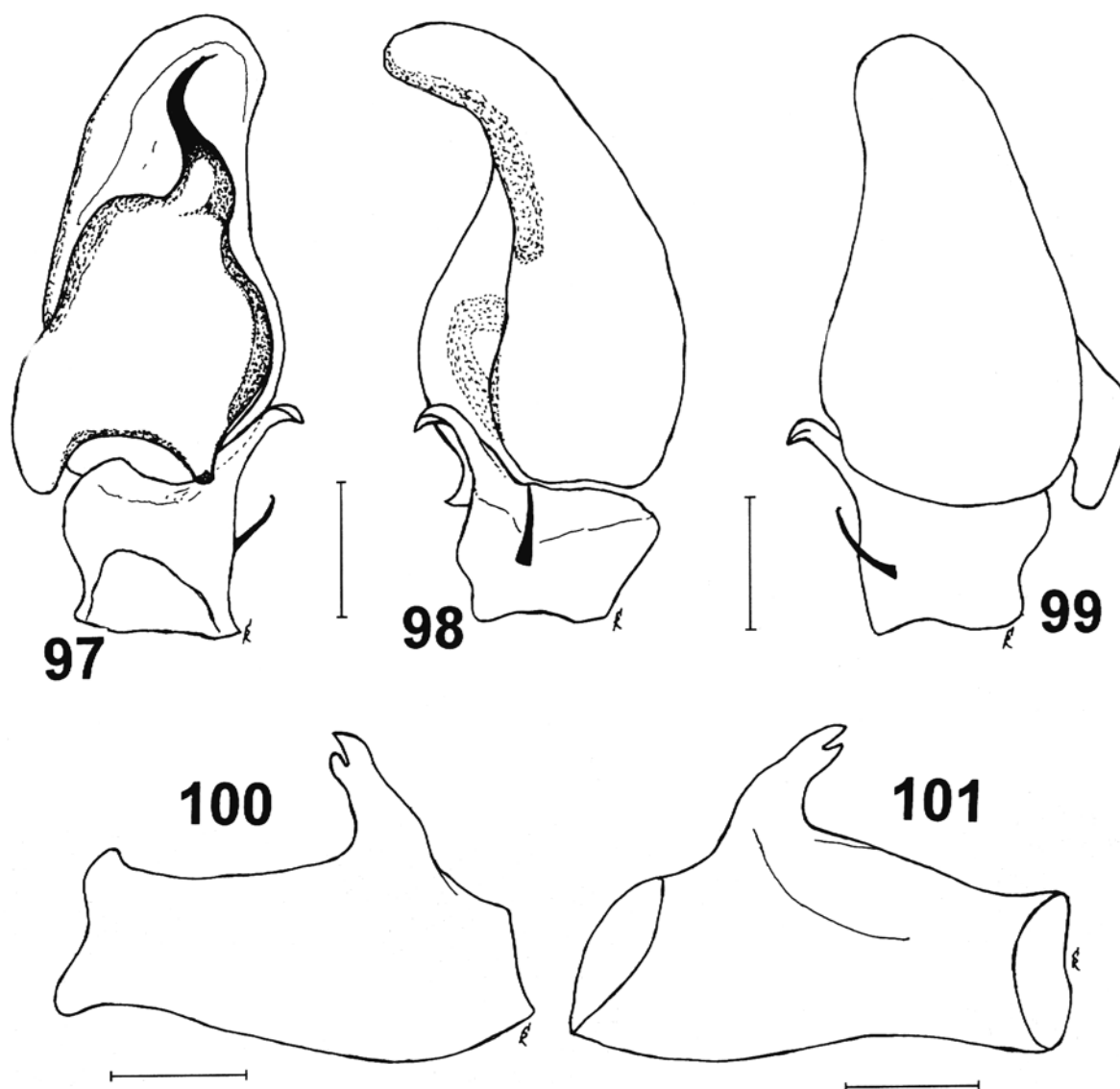
Distribution. N-Kazakhstan only [Logunov, 1992; current data].

Description. See Logunov [1992].



Figs 87-96. *Heliophanus koktas* Logunov, 1992: 87 — ♂ palp, dorsolateral view; 88 — bulbus, median view; 89 — ditto, ventral view; 90 — ditto, lateral view; 91 — palpal femur, lateral view; 92 — epigyne; 93 — spermathecae, dorsal view; 94 — ditto, rear view; 95 — colour pattern of ♀ body; 96 — ditto of ♂. Scales: 0.1 (87-94) & 1 mm (95-96).

Рис. 87-96. *Heliophanus koktas* Logunov, 1992: 87 — палепа ♂, дорзолатерально; 88 — бульбус, медиально; 89 — то же, вентрально; 90 — то же, латерально; 91 — бедро палепы, латерально; 92 — эпигина; 93 — сперматека, дорзально; 94 — то же, вид сзади; 95 — рисунок окраски у ♀; 96 — то же у ♂. Масштаб: 0,1 (87-94) и 1 мм (95-96).



Figs 97-101. *Heliophanus lineiventris* Simon, 1868: 97 — ♂ palp, ventral view; 98 — ditto, lateral view; 99 — ditto, dorsal view; 100 — palpal femur, lateral view; 101 — ditto, median view. Scale: 0.14 mm.

Рис. 97-101. *Heliophanus lineiventris* Simon, 1868: 97 — палепа самца, вентрально; 98 — то же, латерально; 99 — то же, дорзально; 100 — бедро палепы, латерально; 101 — то же, медиально. Масштаб: 0,14 мм.

Heliophanus lineiventris Simon, 1868

Figs 21, 28, 57-58, 97-100.

H. l.: Nenilin, 1985: 130; Prószyński, 1976: map 74.

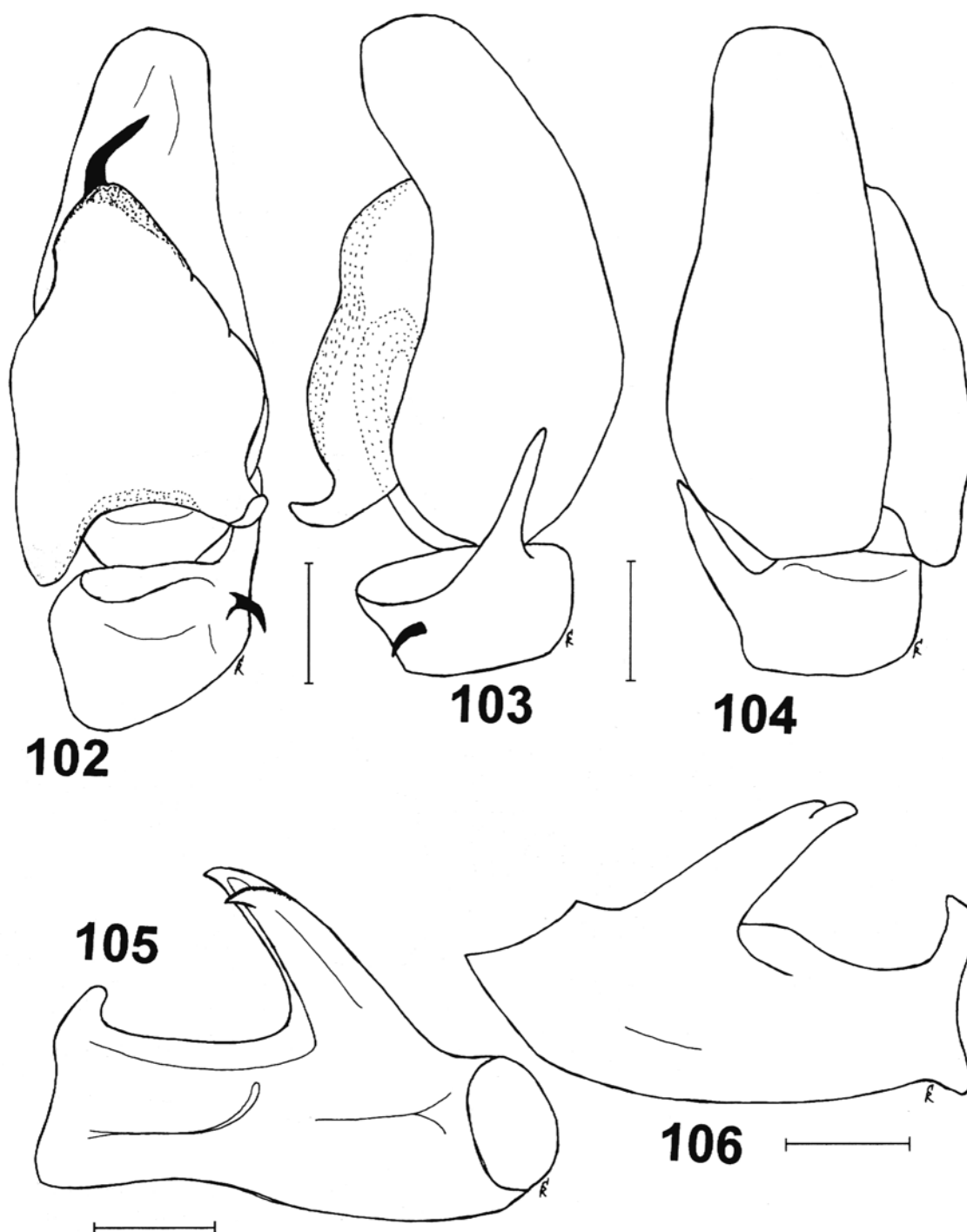
Material. KAZAKHSTAN: 1 ♂, 5 ♀♀ (ISE), Pavlodar Area, Bayanaul Distr., 4-6 km NW of Alkmerghen, 24.08.1990, O.L.; 1 ♂ (ZMMU), same area and district, Kyzyltau, 10-12.06.1991, O.L.; 1 ♀ (ISE), environs of Pavlodar, Irtysh River Valley, date ?, O.L.; 1 ♀ (ISE), same area, Mayskoe Distr., 40 km W of Eluboi, 19.08.1990, O.L.; 1 ♀ (ISE), same locality, 10.06.1992, O.L.; 1 ♂, 2 ♀♀ (ZMMU), Uralsk Area, Dzhanibek, depression, 29.05.1974, I. Goryachev; 4 ♂♂, 7 ♀♀ (ZMMU), same locality, 25.08.1982, K.G. Mikhailov.

Diagnosis. See comments in "Diagnosis" under *H. chovdensis*.

Distribution. This trans-Eurasian temperate species

has hitherto been reported from Middle Asia by Mikhailov & Fet [1994], namely from the SW-Kopetdagh. However, beyond any doubt, their record belonged to *H. turanicus* (Fet's specimens re-examined). In fact all previous records of *H. lineiventris* in Middle Asia have turned out to belong to either *H. chovdensis* or to *H. turanicus* (Fig. 21), while the true *H. lineiventris* seems to be restricted to N-Kazakhstan only.

Description. MALE. Measurements. Carapace 1.70 long, 1.10 wide, 0.75 high at PLE. Ocular area 0.65 long, 0.85 wide anteriorly and 1.00 wide posteriorly. Diameter of AME 0.25. Abdomen 2.00 long, 1.25 wide. Cheliceral length 0.45. Length of leg segments: leg I: 0.75 + 0.38 + 0.62 + 0.50 + 0.42; leg II: 0.70 + 0.40 + 0.47 + 0.38 + 0.38; leg III: 0.62 + 0.38 + 0.40 + 0.58 + 0.40; leg IV: 0.87 + 0.38



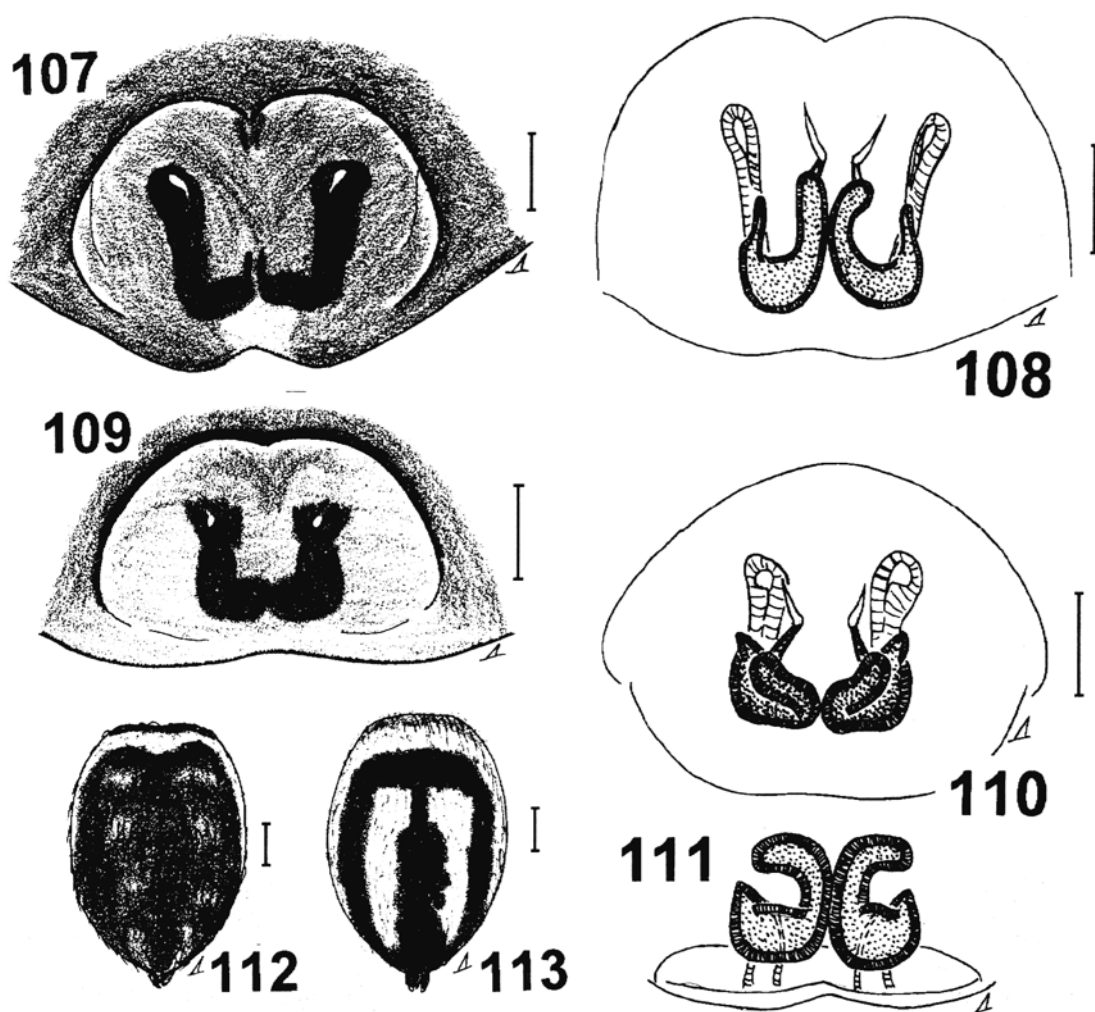
Figs 102-106. *Heliophanus mordax* (O.P.-Cambridge, 1872): 102 — ♂ palp, ventral view; 103 — ditto, lateral view; 104 — ditto, dorsal view; 105 — palpal femur, median view; 106 — ditto, lateral view. Scale: 0.14 mm.

Рис. 102-106. *Heliophanus mordax* (O.P.-Cambridge, 1872): 102 — палепа самца, вентрально; 103 — то же, латерально; 104 — то же, дорзально; 105 — бедро пальпы, медиально; 106 — то же, латерально. Масштаб: 0,14 мм.

+ 0.60 + 0.62 + 0.50. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.2-2; Mt v.2-2. Leg II: Fm d.1-1-1; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt. 1ap., v.1-2ap. Leg IV: Fm d.1-1-1, pr.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Coloration typical

for *Heliophanus*. Legs yellow with brownish femora. First leg usually darker. Abdomen grey with anterior tufts of white hairs. Palpal structure as in Figs 97-101.

FEMALE. Measurements. Carapace 2.24 long, 1.35 wide, 0.80 high at PLE. Ocular area 0.70 long, 1.00 wide anteriorly and 1.20 wide posteriorly. Diameter of AME



Figs 107-113. ♀ genitalia and abdominal colour pattern of *Heliophanus mordax* (O.P.-Cambridge, 1872) (107-108, 112) and *H. verus* Wesolowska, 1986 (109-111, 113): 107, 109 — epigyne; 108, 110 — spermathecae, dorsal view; 111 — ditto, rear view; 112, 113 — ♀ dorsal colour pattern. Scales: 0.1 (107-111) & 1 mm (112-113).

Рис. 107-113. Гениталии ♀ и окраска брюшка у *Heliophanus mordax* (О.П.-Кембридж, 1872) (107-108, 112) и *H. verus* Весоловская, 1986 (109-111, 113): 107, 109 — эпигина; 108, 110 — сперматеки, дорзально; 111 — то же, сзади; 112, 113 — окраска дорзума ♀. Масштаб: 0,1 (107-111) & 1 мм (112-113).

0.35. Abdomen 3.51 long, 2.04 wide. Cheliceral length: 0.62. Length of leg segments: leg I: 0.82 + 0.47 + 0.62 + 0.42 + 0.38; leg II: 0.75 + 0.50 + 0.53 + 0.42 + 0.38; leg III: 0.87 + 0.50 + 0.50 + 0.62 + 0.45; leg IV: 1.13 + 0.50 + 0.75 + 0.87 + 0.60. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.1-1; Mt v.2-2. Leg II: Fm d.1-1-1; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, rt.1ap.; Tb pr. and rt.1-1, v.1-1ap.; Mt d.2-2ap., v.2ap., pr. and rt.1ap. Leg IV: Fm d.1-1-1; Tb pr.1-1, rt.1-1-1, v.2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Coloration as in ♂, but all legs completely yellow. Epigyne and spermathecae as in Figs 28, 57-58.

Heliophanus mordax (O. P.-Cambridge, 1872)
Figs 102-108, 113-114.

H. m.: Wesolowska, 1986: 10, 41, figs 476-486, map 895.
H. ignorabilis Wesolowska, 1986: 10, 214, figs 661-666, map 897 (in part).
H. m.: Wesolowska, 1996: 30.

Material. AZERBAIJAN: 1 ♀ (ZMMU), Nagornyi Karabakh, Azokh, 8.08.1986, P.D.; 1 ♂, 1 ♀ (ZMMU), 4 ♂ (ISE), Talysh Mts., Lerik Distr., Zuvand, Gosmalian and Dighiakh, 1400 m alt., 15.05.1985, P.D.; 1 ♂ (ISE), Zuvand, Divagach, 2.07.1985, P.D.; 2 ♀♀ (ISE), Lenkoran Distr., Gaftoni, 3.05.1985, P.D.; 1 ♂ (ZMMU), distr. ?, Kyurdmashi, 12.05.1986, P.D.; 1 ♀ (ZMMU), Khanlar, 19.08.1986, P.D. — DAGHESTAN: 2 ♂♂, 1 ♀ (ZMMU), Kizilyurt Distr., Kakayurt River Valley, 18.05.1991, O.V. Volgin & O.V. Zabelin. — KAZAKHSTAN: 2 ♀♀ (ISE), Akstafa-Chai River, 28.05.1981, A.Z. — TURKMENISTAN: 1 ♂ (ZISP), SW-Kopetdagh, Khasar Mts., 27.05.1982, S.N. Zabelin; 4 ♂♂, 4 ♀♀ (ZISP), same area, Aidere, 06.1979, V.Y. Fet; 2 ♂♂ (ISE), same locality, 24.04.1991, V.D. & V.K. Zinchenko; 1 ♂, 1 ♀ (ISE), same locality, Kara-Kala, Parkhai, 4.05.1987, A.Z.; 1 ♂ (ZISP), same locality, 20.04.1985, S.Z.; 1 ♀ (ZMMU), same locality, S slope of Isak Mt., 5.05.1988, I.V. Muratov; 1 ♀ (ISE), same area, Tersankan, shore of Sumbar River, 11.07.1990, A.N. Galkin; 4 ♂♂, 1 ♀ (ISE), C-Kopetdagh, Firyuza, 5.04-28.05.1991, V.D.; 1 ♂ (ISE), C-Kopetdagh, 20 km E of Nukhur, Canyon Karayalchi, 28.04.1991, V.D.; 1 ♂ (ISE), 8 km NE of Guzghy (= Kushka), Morgunovka, 9.04.1993, S.Z.

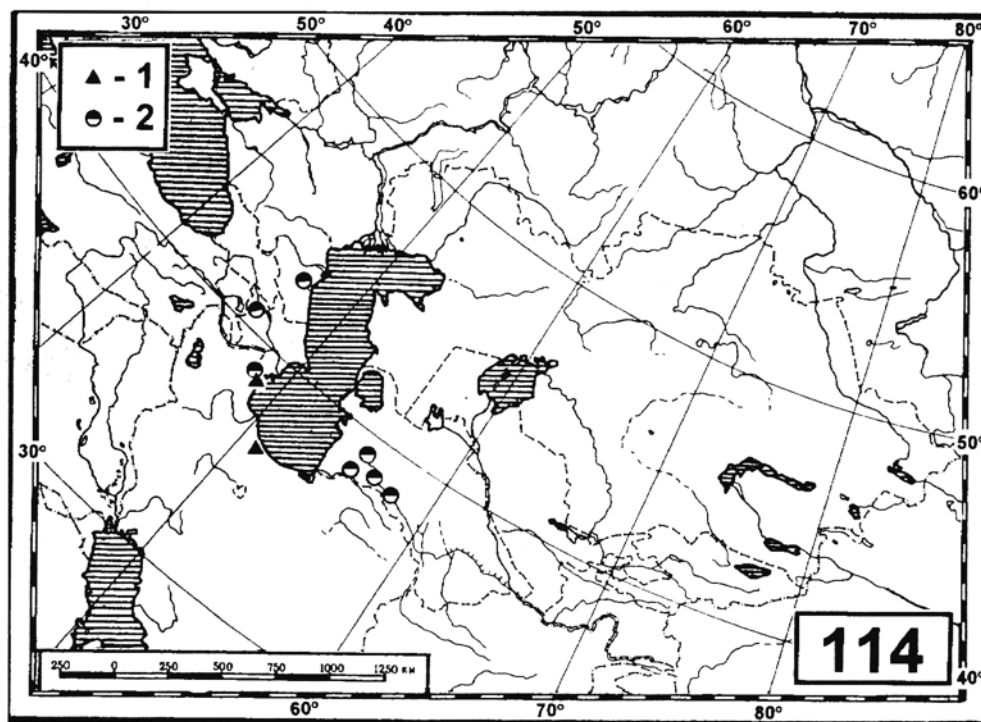


Fig. 114. Localities of *H. verus* (1) and *H. mordax* (2) in the Caucasus and in Middle Asia.

Рис. 114. Местонахождения *H. verus* (1) и *H. mordax* (2) на Кавказе и в Средней Азии.

Diagnosis. Among Middle Asian congeners, the ♀ of *H. mordax* is rather similar to that of *H. flavipes*, but differs in having shorter insemination ducts (cf. Figs 73-74 and 102-108), as well as by the presence of a pair of longitudinal white lines on the dorsum (Fig. 113). The ♂ of *H. mordax* is closest to that of *H. conspicuus* Wesolowska, 1986, the latter taxon described from Algeria, but it can be separated by the proportions of the tegulum and the narrower femoral process [cf. Wesolowska, 1986: figs 487-491]. Both ♂ and ♀ of *H. mordax* are close to those of *H. decoratus* L. Koch, 1875, the latter species known from the Near East and N-Africa [cf. Wesolowska, 1986: figs 563-580], but they can be distinguished by the longer insemination ducts in ♀♀ and the shape of the tegulum in ♂♂. Besides that, ♀♀ are very close to those of *H. verus* (for differences, see comments in "Diagnosis" under *H. verus*).

Distribution. Afghanistan, Turkey, Syria, Lebanon, the Caucasus, and Middle Asia (Fig. 114). In Middle Asia, *H. mordax* has hitherto been reported only from the SW-Kopetdagh (Turkmenistan) [Wesolowska, 1996]. Fet [1983] has referred to this species from same locality as a *Heliophanus* sp. (Fet's specimens re-examined).

Description. MALE. Measurements. Carapace 2.13 long, 1.50 wide, 0.90 high at PLE. Ocular area 0.62 long, 1.13 wide anteriorly and 1.25 wide posteriorly. Diameter of AME 0.38. Abdomen 2.00 long, 1.38 wide. Cheliceral length 0.62. Length of leg segments: leg I: 1.00 + 0.50 + 0.75 + 0.70 + 0.55; leg II: 1.00 + 0.50 + 0.65 + 0.50 + 0.45; leg III: 0.85 + 0.50 + 0.75 + 0.85 + 0.65; leg IV: 1.05 + 0.50 + 0.75 + 0.85 + 0.65. Leg spination. Leg I: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.2-1; Mt v.2-2ap. Leg II: Fm d.1-1-1; pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr. and rt.1ap.; Tb pr. and rt.1-1, v.1-2ap.; Mt

d.1-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.1-2-2ap., pr. and rt.1ap., v.1-2ap. Coloration: Carapace dark brown, eye field black. Sternum, maxillae and chelicerae brown. Abdomen black. Legs brown with yellow tarsi and metatarsi. Palpal structure as in Figs 102-106.

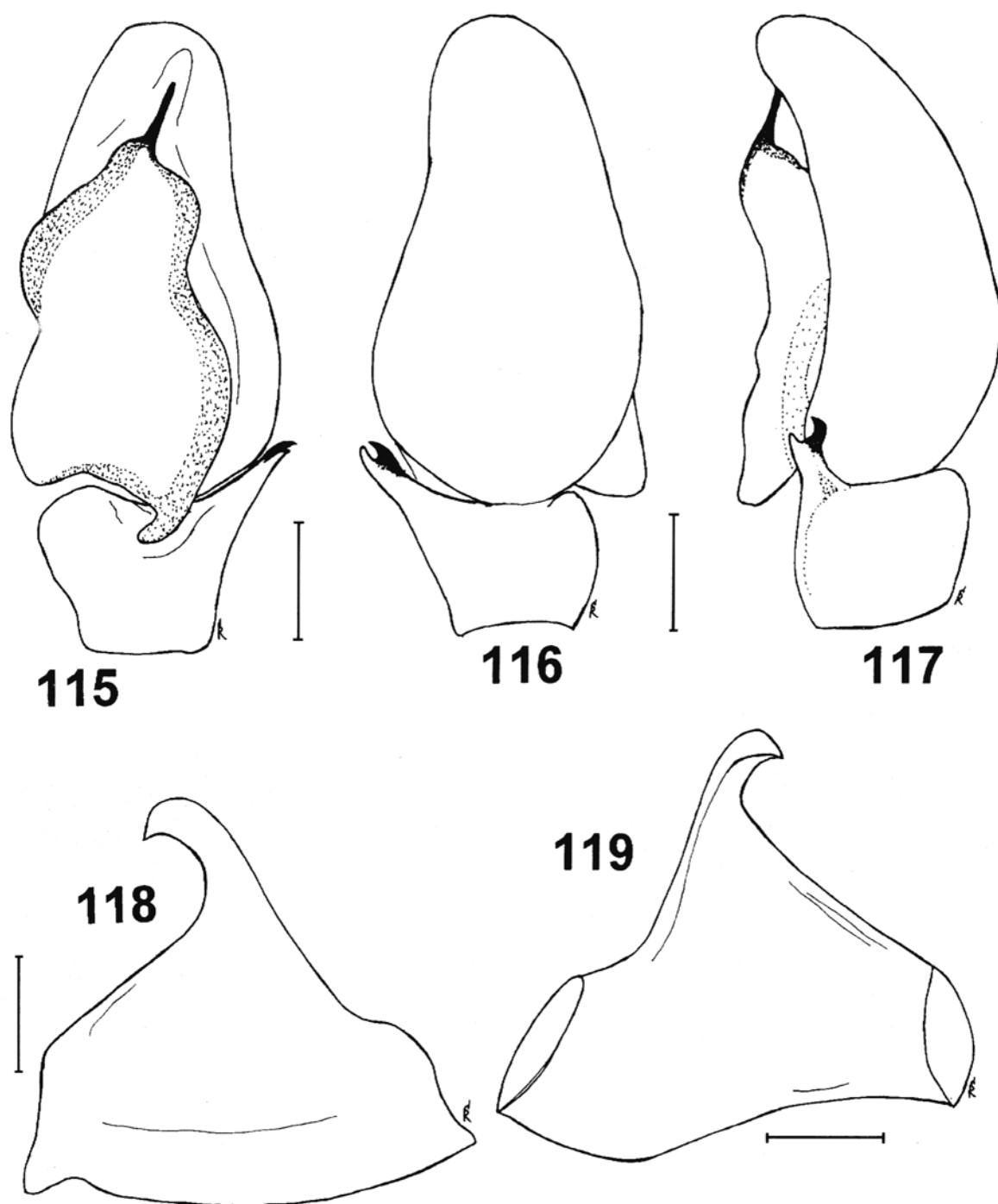
FEMALE. Measurements. Carapace 2.30 long, 1.70 wide, 1.00 high at PLE. Ocular area 1.00 long, 1.14 wide anteriorly and 1.25 wide posteriorly. Diameter of AME 0.35. Abdomen 4.46 long, 3.00 wide. Cheliceral length 0.60. Length of leg segments: leg I: 1.00 + 0.55 + 0.75 + 0.70 + 0.55; leg II: 1.00 + 0.50 + 0.65 + 0.50 + 0.60; leg III: 1.25 + 0.50 + 0.75 + 0.80 + 0.60; leg IV: 1.50 + 0.60 + 1.05 + 1.00 + 0.58. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.2-2; Mt v.2-2. Leg II: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr.1-1, rt.1-1-1, v.1-1ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1, pr.1ap.; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.1-2-2ap., pr. and rt.1ap., v.1-2ap. Coloration as in ♂ but lighter: abdomen grey, and legs yellow. Epigyne and spermathecae as in Figs 107-108.

Heliophanus patagiatus Thorell, 1875 Figs 61, 115-122.

H. p.: Spassky & Shnitnikov, 1938: 293; Nenilin, 1984a: 18, 1984b: 136, 1985: 130; Andreeva, 1975: 340, 1976: 95, 110; Savelieva, 1990: 173; Mikhailov & Fet, 1994: 517; Zonshtein, 1984: 148; Dunin, 1979: 38; 1984: 58.

H. p. albolineatus: Nenilin, 1985: 130.

Material. KYRGHYZSTAN: 4 ♂♂ (ZISP), 3 ♂♂ (ISE), 1 ♀ (ZMMU), -20 km S of Bishkek, Kirghizskii Mt. Range, Canyon Malinovoye, 27.07.1984, S.O.; 1 ♀ (ZMMU), same range, Canyon Issyk-Ata, 1700 m alt., 24.06.1984, S.O.; 4 ♂♂ (ISE), Lake Issyk-Kul,

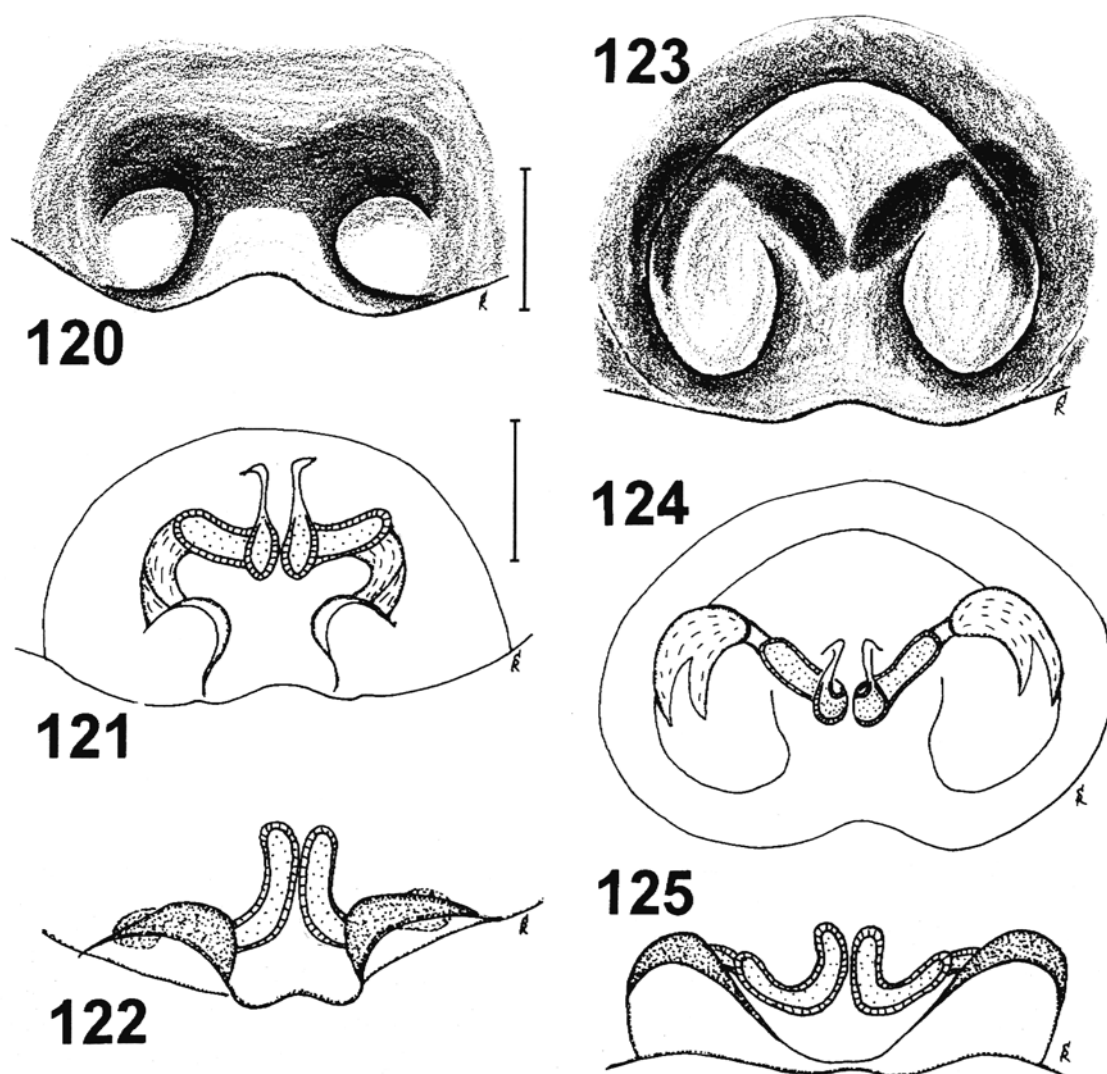


Figs 115-119. *Heliophanus patagiatus* Thorell, 1875: 115 — ♂ palp, ventral view; 116 — ditto, dorsal view; 117 — ditto, lateral view; 118 — palpal femur, lateral view; 119 — ditto, median view. Scale: 0.14 mm.

Рис. 115-119. *Heliophanus patagiatus* Thorell, 1875: 115 — палепа самца, вентрально; 116 — то же, дорзально; 117 — то же, латерально; 118 — бедро палепы, латерально; 119 — то же, медиально. Масштаб: 0,14 мм.

Teploklyuchenka, 19.06.1995, S.O.; 1 ♂ (ISE), same locality, Chon-Uryukty, 16.06.1991, S.O.; 2 ♀♀ (ZISP), N slopes of Kirghizskii Mt. Range, Uzun-Bulak, 06.1995, S.O.; 1 ♀ (ISE), Dzhanghi-Pakhta, 10.06.1986, S.O.; 1 ♀ (ZMMU), Canyon Kuturga, 14.07.1977, S.O.; 1 ♀ (ISE), E part of Susamyrtov Mt. Range, Kobuksu River, 27.07.1993, S.O.; 1 ♀ (ISE), Talasskii Mt. Range, Canyon Boomskoye, Kapkan, 3.07.1985, S.O.; 1 ♂ (ZISP), Talas Valley, Shaker,

24-27.07.1979, S.Z.; 2 ♀♀ (ZISP), same valley, Kok-Sai, 2.08.1979, S.Z.; 1 ♂, 1 ♀ (ZMMU), Lake Issyk-Kul, Dolinka, 26.06.1980, S.Z.; 1 ♀ (ISE), Terskei-Alatau Mt. Range, Arasan River, 19.06.1991, S.O. — KAZAKHSTAN: 1 ♂ (ZMMU), environs of Pavlodar, Irtysh River Valley, 28.06.1994, O.L.; 3 ♂♂, 6 ♀♀ (ISE), 25 km N of Pavlodar, Irtysh River Valley, 8.06.1992, O.L.; 1 ♂, 2 ♀♀ (ISE), 20 km S of Pavlodar, Zarya, 17.06.1992, O.L.; 1 ♀ (ISE),



Figs 120-125. ♀ genitalia of *Heliophanus patagiatus* Thorell, 1875 (120-122) and *H. potanini* Schenkel, 1963 (123-125): 120, 121 — epigyne; 121, 124 — spermathecae, dorsal view; 122, 125 — ditto, rear view. Scale: 0.14 mm.

Рис. 120-125. Гениталии ♀ у *Heliophanus patagiatus* Thorell, 1875 (120-122) и *H. potanini* Schenkel, 1963 (123-125): 120, 121 — эпигина; 121, 124 — сперматека, дорзально; 122, 125 — то же, сзади. Масштаб: 0,14 мм.

Pavlodar Area, Ekibastuz Distr., 6 km SE of Shiderty, Shiderty River Valley, 1.08.1992, O.L.; 1 ♀ (ISE), Tarbagatai Mt. Range, 45 km S of Oighilik, 22.07.1993, S.O.; 1 ♂ (ISE), Zhambyl (= Dzhambul) Area, Vysokoe, 9.05.1984, coll. ?; 1 ♂ (ISE), S-Kazakhstan Area, Arys, 28.04.1993, D.L.; 2 ♀♀ (ISE), Taldy-Kurgan Area, 5-15 km NE of Tekeli, Kora River, 13.06.1993, V.K. Zinchenko; 1 ♂ (SVO), canyon of Charyn River, 15 km N of Chundukha, 12.06.1993, S.O.; 1 ♀ (ZISP), environs of Almaty, Kumbel, 1800-2500 m alt., 26.06.1983, C.K. Tarabaev; 1 ♀ (ZISP), Almaty Area, Ketmen Mt. Range, Bolshoi Aksai Canyon, Lake Ketmen, 8.07.1989, S.O.; 1 ♂, 1 ♀ (ZMMU), Uralsk Area, Dzhanibek, 30.06.1982, K.G. Mikhailov. — UNCERTAIN LOCALITY: 1 ♀ (ISE), Bymburovo (?), 17.08-6.09.1991, coll. ?

Diagnosis. *H. patagiatus* can easily be separated from other Central Asian congeners by the strongly chitinized epigyne with an elevated central part (Fig. 120) and by the uniramous, claw-shaped tibial apophysis (Figs 115-117).

Distribution. This trans-Palearctic polyzonal species has hitherto been reported from Middle Asia, namely

from Kyrgyzstan: Lake Issyk-Kul, Canyon Kuturga environs of Bishkek (Dolinka), Uzun-Bulak, Talasskii Ferganskii and Chatkalskii mt. ranges [Nenilin, 1984b; Zonshtein, 1984]; E- and S-Kazakhstan [Spassky & Shnitnikov, 1937; Savelieva, 1990]; Turkmenistan (without exact locality) [Mikhailov & Fet, 1994]; and Tajikistan: Khozratisho and Hissar mt. ranges, Canyon Varzob, Takob, and Pass Fakhrabad [Andreeva, 1975, 1976].

Notes. *H. patagiatus* has repeatedly been reported from the Caucasus [Dunin, 1979, 1984]. However, we have found relevant specimens belonging to this species neither in Dunin's collections nor in any other salticid material deriving from the Caucasus. Hence the occurrence of *H. patagiatus* in the entire Caucasus requires confirmation upon pertinent material.

Description. MALE. Measurements. Carapace 1.80 long, 1.15 wide, 0.75 high at PLE. Ocular area 0.70 long, 0.95 wide anteriorly and 1.00 wide posteriorly. Diameter of AME 0.35. Abdomen 1.80 long, 1.25 wide. Cheliceral

length 0.62. Length of leg segments: leg I: 0.87 + 0.50 + 0.62 + 0.50 + 0.40; leg II: 0.70 + 0.42 + 0.16 + 0.38 + 0.40; leg III: 0.75 + 0.38 + 0.50 + 0.58 + 0.47; leg IV: 1.00 + 0.50 + 0.75 + 0.85 + 0.42. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.2-1; Mt v.2-2ap. Leg II: Fm d.1-1-1; pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr. and rt.1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.2ap. Leg IV: Fm d.1-1-1; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.31-2ap. Coloration typical for *Heliophanus*. Dorsally, all femora yellow with a brown longitudinal line, ventrally dark brown. All tarsi and metatarsi yellow. Palpal structure as in Figs 115-119.

FEMALE. Measurements. Carapace 2.25 long, 1.50 wide, 1.25 high at PLE. Ocular area 0.65 long, 1.20 wide anteriorly and 1.25 wide posteriorly. Diameter of AME 0.35. Abdomen 3.00 long, 2.00 wide. Cheliceral length 0.75. Length of leg segments: leg I: 0.95 + 0.65 + 0.70 + 0.50 + 0.55; leg II: 0.85 + 0.60 + 0.68 + 0.50 + 0.55; leg III: 0.90 + 0.50 + 0.65 + 0.75 + 0.70; leg IV: 1.25 + 0.65 + 1.00 + 1.05 + 0.70. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.2-2; Mt v.2-2. Leg II: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr. and rt.1-1, v.1ap.; Mt d.1-2ap., pr. and rt.1ap., v.2ap. Leg IV: Fm d.1-1-1; Tb pr. and rt.1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Coloration as in ♂, but lighter. Epigyne and spermathecae as in Figs 120-122.

Heliophanus potanini Schenkel, 1963
Figs 61, 123-131.

H. p.: Nenilin, 1984b: 136; 1985: 130; Logunov, 1992: 66; Zyuzin & Tarabaev, 1994: 400.

H. cambridgei: Spassky & Shnitnikov, 1937: 294.

H. tribulosus: Prószyński, 1979: 309-310, figs 117-118, non Simon, 1868.

Material. **TAJIKISTAN:** 2 ♂♂, 2 ♀♀ (ZISP), 1 ♂ (ISE), Komsomolabad Distr., Sanglok Mt. Range, Lyulya-Kharvi, 1800 m alt., 20.07.1978, S.O.; 1 ♂ (ZMMU), S part of Nurekskoye Reservoir, crest of Sanglok Mt. Range, 2100 m alt., 7.05.1993, S.Z.; 1 ♂ (ZMMU), 4 ♂♂ (ISE), same range, Seistan, 3-7.05.1991, S.O.; 1 ♀ (ISE), Yazgulem, 18.07.1988, S.O. — **KYRGYZSTAN:** 1 ♂, 4 ♀♀ (ISE), 20 km S of Bishkek, Kirghizskii Mt. Range, Canyon Malinovoye, 27-28.07.1984, S.O.; 2 ♂♂ (ISE), same locality, 19.04.1992, S.Z.; 2 ♂♂ (ISE), same locality, Canyon Kara-Balta, 16 km S of Sosnovka, 25.05.1995, S.O.; 1 ♂ (ISE), same locality, Ala-Archa, 1.07.1991, S.O.; 1 ♂ (ZISP), environs of Bishkek, Chu Valley, summer 1980, S.Z.; 1 ♀ (ISE), same locality, Kok-Dzhar, 28.05.1985, S.O.; 4 ♀♀ (ISE), Chon-Aryk, 43°19'N, 78°58'E, 4.07.1994, D.M.; 1 ♂ (ZISP), Baubashata Mt. Range, Zindan Mt., 11.08.1981, S.Z.; 1 ♀ (ISE), Dzhahalabad Area, Dzhan-Dzhal Distr., Toli-Kunar, 14.06.1992, A.Z. & A. Fedorov; 2 ♀♀ (ZISP), same locality, 5 km SW of Kyzyl-Dzhar, 22.06.1992, A.Z. & A. Fedorov; 1 ♂ (ISE), same area, Baubashata Mt. Range, Arslanbob, 14.05.1993, S.O.; 1 ♂ (ZISP), Kichik-Alai Mt. Range, Kirghiz-Ata River, S of Iski-Naukat, Karagai, 2500-3000 m alt., 1.06.1985, S.Z.; 1 ♂ (ZMMU), Inner Tian-Shan Mts., E part of Susamyr-Too Mt. Range, middle reaches of Kokmeren River, 21.06.1991, S.Z.; 2 ♀♀ (ISE), Kunghei-Alatoo Mt. Range, Canyon Boomskoye, 28.06.1991, S.O.; 1 ♀ (ZISP), same canyon, Kyzyl-Kus, 26.05.1992, S.O.; 1 ♂ (ISE), same locality, 28.06.1991, S.O.; 2 ♀♀ (ISE), same canyon, Kapkan, 3.07.1985, S.O.; 1 ♂, 1 ♀ (ZMMU), Sary-Chelek Reserve, 2 km S of Arkit, 20.06.1992, A.Z. & A. Fedorov; 1 ♂, 2 ♀♀ (ZMMU), 1 ♀ (ISE), Talas Area, Toktogul Distr., Pass Kek-Bel, 1500 m alt., 27.06.1992, A.Z. & A. Fedorov; 1 ♂ (ZISP), Talasskii Mt. Range, Itagar, 2.06.1987, S.Z.; 2 ♂♂ (ISE), Toktogulskoye Reservoir, Uzun-Akhmat, 4.06.1995, S.O.; 1 ♂, 2 ♀♀ (ISE), 20 km N of Toktogulskoye Reservoir, Chichkan River Valley (left tributary of Naryn River), 1600 m alt., 29.05-

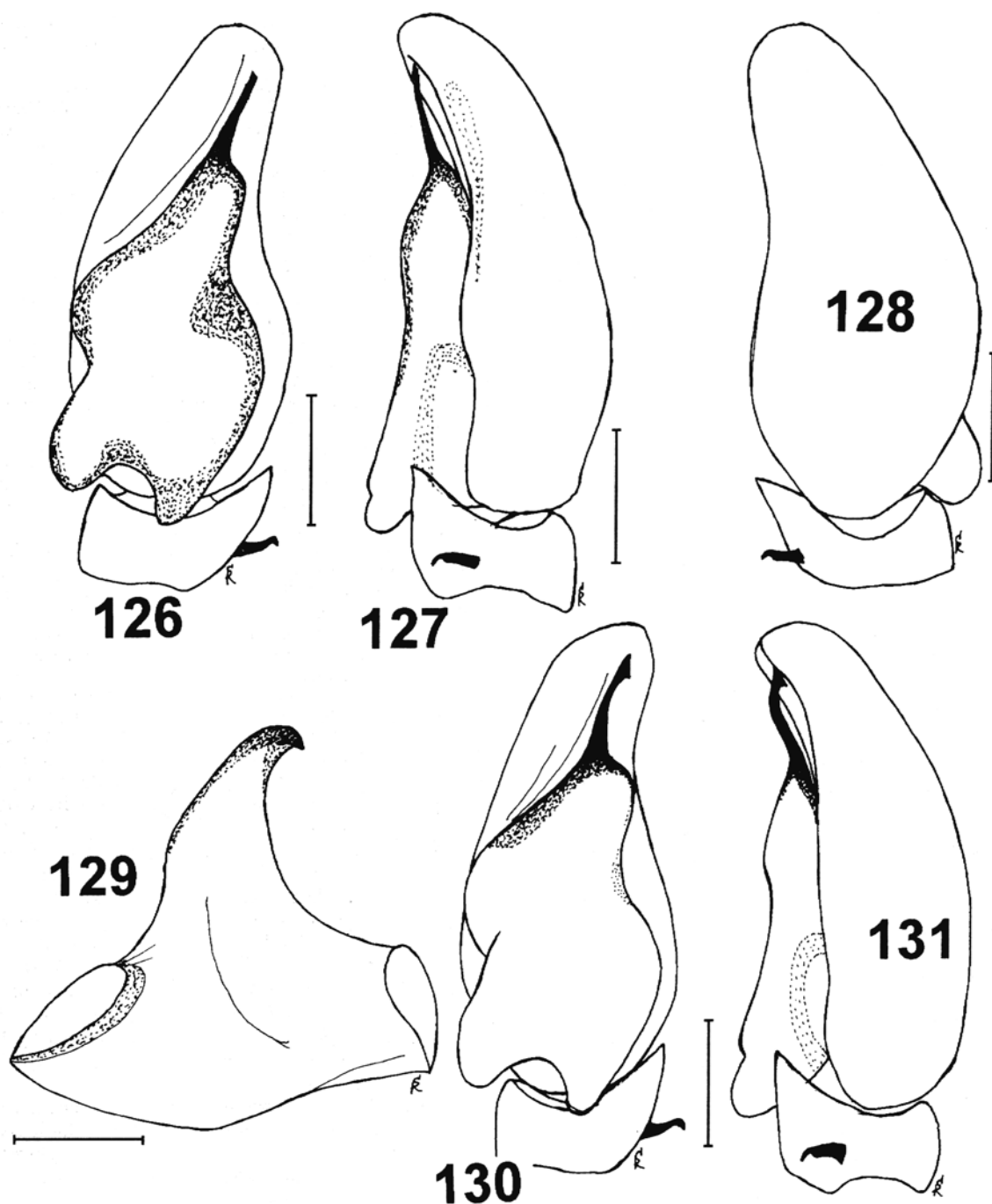
1.06.1995, S.O. & D.M.; 1 ♀ (ISE), Lake Issyk-Kul, 21.08.1980, S.Z.; 1 ♀ (ISE), Kokerim Mt. Range, 41°27'N, 73°55'E, 11.08.1995, D.M.; 2 ♂♂ (ISE), W-Kyrgyzstan, Kara-Archa, 42°47'N, 71°78'E, 1400 m alt., 4.05.1994, D.M.; 1 ♀ (ISE), 13 km N of Tash-Kumyr, Kara-Tyt, 41°28'N, 72°14'E, 18-23.05.1995, D.M.; 1 ♀ (ISE), Terskei-Alatoo Mt. Range, Canyon Tosar, 1700 m alt., 10.08.1987, S.O.; 1 ♀ (ISE), same locality, Arasan, 19.06.1991, S.O. — **UZBEKISTAN:** 1 ♀ (ISE), Surkhadaryinskaya Area, 60 km NNW of Kokand, Khatan, Pass Kamchik, 41°02'N, 70°23'E, 16.05.1994, D.M.; 1 ♂ (ISE), same area, Baisun Distr., Baksun-Tau Mt. Range, Khatak, Canyon Baglydara, 1500-1800 m alt., 28.04.1986, coll. ?; 1 ♂ (ISE), same range, Baksun, 18.05.1976, A.P. Kononenko; 1 ♂ (ISE), Kuhitangtau Mt. Range, Kamnar-Tepa, 19.05.1983, A.B. Nenilin; 1 ♂ (ZMMU), same range, Ak-Tau, 22.05.1984, A.V. Tanasevitch; 1 ♂, 2 ♀♀ (ISE), Bukhara Area, 20 km S of Kagan, Farm Dzheiranii, 19.05.1994, S.O.; 2 ♀♀ (ZISP), Tashkent Area, Chirchik River, Tuzel, 31.08.1979, A.B. Nenilin; 1 ♀ (ZISP), same area, Bostanlyk Distr., Aksak-Ata, 26.07.1978, A.B. Nenilin; 2 ♂♂ (ZMMU), Chatkalskii Reserve, Canyon Bash-Kyzyl-Sai, 18.09.1983, K.Y. Eskov. — **KAZAKHSTAN:** 2 ♂♂ (ISE), Almaty Area, Talgar Distr., Kapchagaiskoye Reservoir, 5.09.1983, Y.M. Marusik; 12 ♀♀ (ISE), same area, Chilik Distr., 157th road-km from Almaty to Narynkol, Syugaty Mts., Yablonevaya Shchel, 22.04.1990, C.K. Tarabaev; 7 ♂♂, 1 ♀ (ISE), same place, Uzunagach, 12.05.1992, A.Z.; 1 ♂ (ISE), 80-90 km NW of Almaty, Zailiiskii Alatau Mt. Range, Bolshaya Almatinka River, 7.06.1993, S.O.; 1 ♀ (ZISP), det. as *H. cambridgei*, Almaty Area, Semirechie, S. Spassky's Collection; 4 ♂♂, 1 ♀ (ISE), Shymkent (= Chimkent) Area, 5 km N of Chardara, 04.1993, D.L. & A.Z.; 1 ♀ (ISE), Zhambyl (= Dzhambul) Area, 15 km NW of Kenen, Chu-Iliiskii Mts., 14.06.1990, A.Z.; 7 ♀♀ (ISE), same area, Moynunkum Distr., 6 km SE of Khantau, Khantau Mts., 10.85.1990, A.Z. & A. Fedorov; 1 ♀ (ISE), same area, Krasnogorsk Distr., 37 km NE of Gheorghievka, Pass Kurдай, 15.06.1990, A.Z. & A. Fedorov; 1 ♂ (ISE), Karatau Mt. Range, 9 km N of Achisay, 43°33'N, 68°53'E, 1200-1500 m alt., 12-13.05.1994, D.M.

Diagnosis. The ♀ of *H. potanini* is similar to that of *H. auratus*, but the insemination ducts, usually visible through translucent integuments, jutting out of the anterior edge of the epigynal depression in the former species (Fig. 123), and lying completely inside the depression in the latter one (Fig. 6). Besides that, the epigyne of *H. potanini* usually consists of two clearly visible depressions, while that of *H. auratus* often appears like a single wide depression (Figs 7-8) [cf. Wesolowska, 1986: figs 634 and 738]. By the structure of the embolus, the ♂ of *H. potanini* can be mistaken for that of *H. patagiatus*, but it can be separated by the absence of a claw-shaped tibial apophysis (cf. Figs 126-128, 130-131 and 115-117).

Distribution. *H. potanini* is currently known from Middle and Central Asia only (Fig. 61). In Middle Asia, *H. potanini* has hitherto been reported from Kyrgyzstan [Nenilin, 1984b], W- and S-Kazakhstan [Logunov, 1992a; Zyuzin & Tarabaev, 1994].

Notes. There are two morphological varieties of *H. potanini* in the collections studied. The ♂♂ of one of these (the bulk) display a sharpened end of the embolus (Figs 126-127) and a dark brown coloration, while a single male showed a slightly broadened tip of the embolus and an almost yellow coloration (Figs 130-131). The record of the latter ♂ is arrowed in Fig. 61. At the moment it remains unclear whether it belongs to a separate species or is conspecific with *H. potanini*. Additional material is warranted to resolve the problem.

Description. **MALE.** Measurements. Carapace 1.75 long, 1.45 wide, 0.85 high at PLE. Ocular area 0.70 long, 1.00 wide anteriorly and 1.10 wide posteriorly. Diameter of AME 0.34. Abdomen 2.00 long, 1.25 wide. Cheliceral



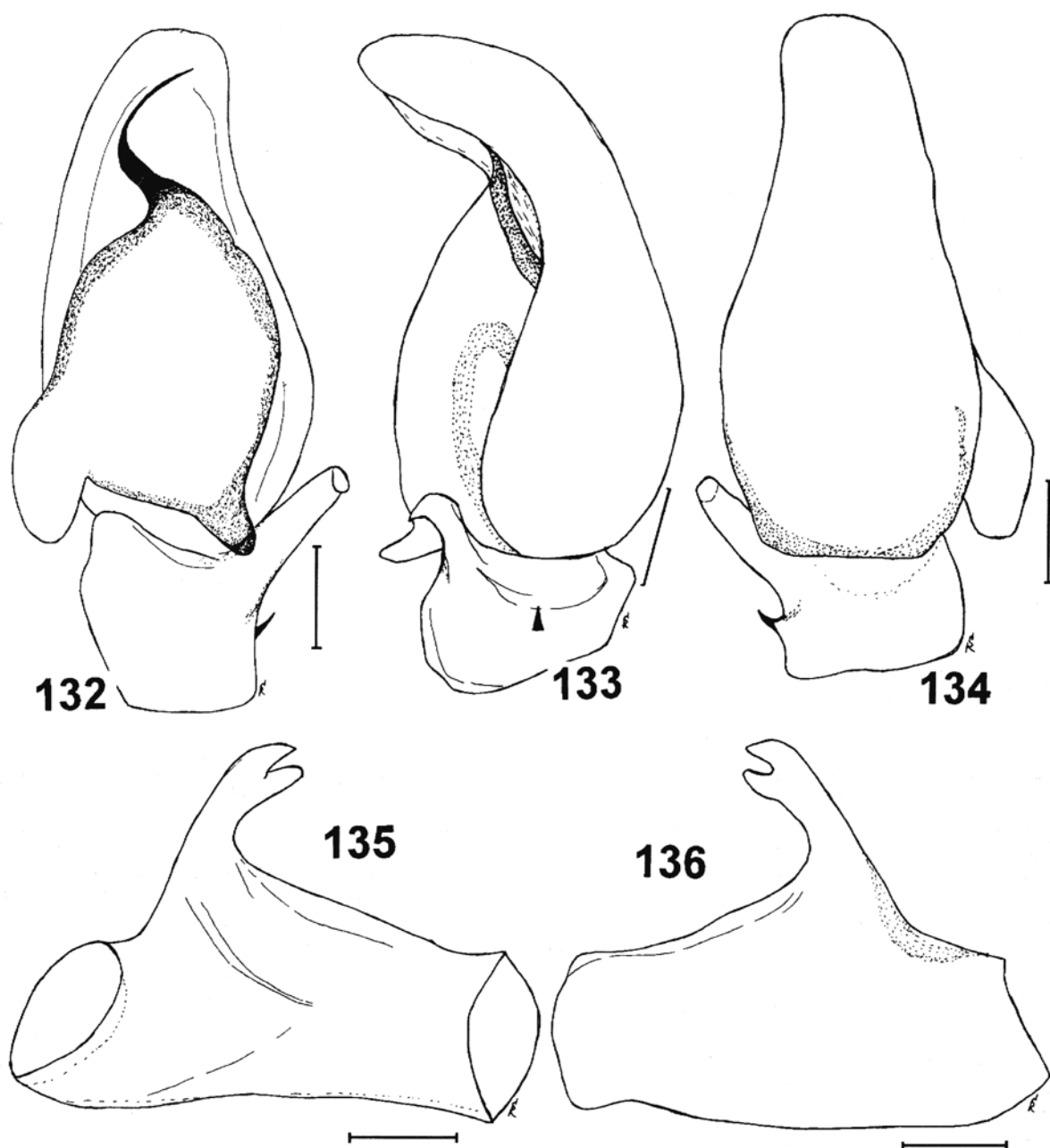
Figs 126-131. *Heliophanus potanini* Schenkel, 1963: 126, 130 — ♂ palp, ventral view; 127, 131 — ditto, lateral view; 128 — ditto, dorsal view; 129 — palpal femur, median view. Scale: 0.14 mm.

Рис. 126-131. *Heliophanus potanini* Schenkel, 1963: 126, 130 — палепа ♂, вентрально; 127, 131 — то же, латерально; 128 — то же, дорзально; 129 — бедро палепы, медиально. Масштаб: 0,14 мм.

length 0.62. Length of leg segments: leg I: 0.87 + 0.50 + 0.62 + 0.58 + 0.50; leg II: 0.82 + 0.50 + 0.46 + 0.50 + 0.50; leg III: 1.05 + 0.50 + 0.62 + 0.58 + 0.55; leg IV: 1.10 + 0.50 + 0.75 + 0.75 + 0.62. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.1-2; Mt v.2-2ap. Leg II: Fm d.1-1-1; pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr.1-1, and rt.1-1-1, v.1-2ap.; Mt d.2ap.,

pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.1-2-2ap., pr. and rt.1ap., v.1-2ap. Coloration typical for *Heliophanus*. Legs brown. Palpal structure as in Figs 126-131.

FEMALE. Measurements. Carapace 2.00 long, 1.65 wide, 0.85 high at PLE. Ocular area 0.90 long, 1.25 wide anteriorly and 1.35 wide posteriorly. Diameter of AME



Figs 132-136. *Heliophanus turanicus* Charitonov, 1969: 132 — ♂ palp, ventral view; 133 — ditto, lateral view; 134 — ditto, dorsal view; 135 — palpal femur, median view; 136 — ditto, lateral view. Scale: 0.14 mm.

Рис. 132-136. *Heliophanus turanicus* Charitonov, 1969: 132 — палепа самца, вентрально; 133 — то же, латерально; 134 — то же, дорзально; 135 — бедро палепы, медиально; 136 — то же, латерально. Масштаб: 0,14 мм.

0.30. Abdomen 3.50 long, 2.5 wide. Cheliceral length 0.62. Length of leg segments: leg I: 1.25 + 0.62 + 0.67 + 0.62 + 0.58; leg II: 1.00 + 0.50 + 0.58 + 0.55 + 0.50; leg III: 1.13 + 0.53 + 0.55 + 0.75 + 0.58; leg IV: 1.50 + 0.55 + 1.25 + 1.13 + 0.60. Leg spination. Leg I: Fm d.1-1-1; Tb pr.0-1, v.2-2; Mt v.2-2. Leg II: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr. and rt.1-1, v.1ap.; Mt d.1-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1; Tb pr., and rt.1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Coloration as in ♂. Epigyne and spermathecae as in Figs 123-125.

Heliophanus turanicus Kharitonov, 1969
Figs 21,30, 55-56, 132-136.

H. t. Kharitonov, 1969: 124-126, figs 13-14.

H. t.: Nenilin, 1984b: 137; 1984a: 19, 1985: 130; Mikhailov & Fet, 1994: 517; Wesolowska, 1996: 30, figs 15-16.

H. lineiventris: Mikhailov & Fet, 1994: 517.

Material. KYRGHYZSTAN: 1 ♂ (ZISP), environs of Bishkek, 13.04.1980, S.Z.; 1 ♂ (ZMMU), same locality, Chu River Valley, Tokmak, 20.05.1979, S.Z.; 1 ♂ (ZISP), Suzakskie Adyry, 10.04.1982, S.Z.; 1 ♀ (ISE), Dzhahalabad Area, 13 km N of Tash-Kumyr, Karatyt, 41°28'N, 72°14'E, 18-23.05.1995, D.M.; 1 ♀ (ISE), same area,

Dzhany-Dzhal Distr., 5 km SW of Kyzyl-Dzhar, 22.06.1992, A.Z.: 1 ♂ (ZISP), environs of Dzhahalabad, 5.04.1982, S.Z. — TAJIKISTAN: 1 ♂ (ZISP), Kurgan-Tyube Area, Karatau Mt. Range, 18.04.1986, S.Z.; 2 ♀♀ (ZISP), W-Pamirs, confluence of Zhak and Pyandzh rivers, 17.06.1971, Medvedev; 1 ♂ (ZISP), Vose(?), 3.10.1975, Chernenko; 1 ♂ (ISE), Kurgan-Tyube Area, border of Yavan and Kuibyshev districts, Shota Rustaveli, Chimsay, Karatau Mt. Range, 18.04.1986, A.Z. & S.Z.; 1 ♀ (ZMMU), same area, Aktau Mt. Range, Gandzhino, 800 m alt., 19.04.1986, A.Z.; 1 ♀ (ZISP), same locality, 13.04.1986, S.Z.; 1 ♂, 2 ♀♀ (ISE), same locality, 19.04.1991, S.O.; 4 ♂ (ISE), Ramgontad(?) Mt. Range, ca. 1200 m alt., 29.04.1984, S.Z.; 2 ♂♂ (ISE), Sanglok Mt. Range, Seistan, 3.05.1991, S.O. — KAZAKHSTAN: 3 ♀♀ (ISE), S-Kazakhstan Area, 102 km NW of Bairkum, 28.05.1993, A.Z.; 2 ♀♀ (ISE), same area, 37 km SW of Bairkum, 11.05.1995, A.Z.; 3 ♂♂, 1 ♀ (ZMMU), 16 ♂♂, 18 ♀ (ISE), environs of Arys, 04-05.1988, 1989, D.L.; 1 ♀ (ISE), same area, 67 km N. of Chimkent, 42°58'N, 69°38'E, 6.05.1994, D.M. — TURKMENISTAN: 11 ♂♂, 6 ♀♀ (ISE), Badkhyz, Canyon Kyzyl-Dzhar and Kepele, 10.04.1993, D.L. & S.O.; 1 ♀ (ISE), same locality, 17.04.1984, Lyapunov; 1 ♂, 1 ♀ (ISE), Karatau Mt. Range, Astana Mt., 25-28.04.1991, S.O.; 1 ♂ (ZISP, det. as *H. lineiventris*), Bakharden, Kolkhoz Zhdanova, 21.06.1977, V.Ya. Fet; 2 ♂♂ (ISE), 37 km SE of Polekhatum, Zulfagarskii Mt. Range, 14.04.1993, S.O.; 2 ♂♂, 1 ♀ (ISE), 20-25 km SE of Polekhatum, Ghezghadyk Mt. Range, 500-1000 m alt., 16.04.1993, D.L.; 2 ♀♀ (ISE), 58 km N of Guzhghy (= Kushka), Kala-i-Mor, 8.04.1993, S.O.; 1 ♀ (ZISP), 8 km N of Guzhghy, Morgunovka, 18.04.1977, M. Sternbergs; 1 ♂ (ISE), same locality, 9.04.1993, S.Z.; 1 ♂ (ISE), same area, 10-18 km N of Guzhghy, 9 km N of Chemen-Ibit, 18.04.1993, D.L.; 1 ♂ (ISE), 8 km NE of Nebit-Dag, 380-1000 m alt., 2.04.1993, D.L. & A.Z.; 2 ♂♂, 1 ♀ (ISE), SW-Kopetdagh, Kara-Kala, 29.03.1993, S.O.; 1 ♂ (ZISP), Khozli-Ogli-Yaglum, 3.11.1903, K.O. Anger. — UZBEKISTAN: 1 ♂ (PSU, lectotype, designated herein), 1 ♂ (PSU, palpless, paralectotype), Kashka-Daryinskaya Area, Yakkabag, 29.03.1942, D.M. Fedotov; 1 ♂ (PSU, paralectotype), same locality, 31.10.1941, D.M. Fedotov; 2 ♂♂, 1 ♀ (ISE), Dzhyzaskaya Area, near border with Samarkand Area, Ishmanon, 6.05.1990, A.Z. & A. Fedorov; 2 ♂♂, 12 ♀♀ (ISE), S-Uzbekistan, Babatag Mt. Range, Ak-Mechet, 28.04-1.05.1995, S.O.; 1 ♀ (ISE), Samarkand Area, Sovetobad Distr., Zerafshanskii Mt. Range, 2.5 km above Dzhan, 8.06.1991, A.Z.; 2 ♀♀ (ISE), same range, 7 km N of Kitab, 26.04.1993, D.L.; 2 ♂♂ (ZISP), Tashkent Area, Dalverzin, 4.09.1980, A.B. Nenilin.

Diagnosis. See comments under "Diagnosis" of *H. chovdensis*.

Distribution. This is a plain Turanian species (Fig. 21) originally described from Uzbekistan: Yakkabag, Ugun and Agalyk [Kharitonov, 1969; Nenilin, 1984a], and hitherto recorded also from Kyrgyzstan: environs of Bishkek, Tokmak, Dzhahalabad [Nenilin, 1984b] and Turkmenistan: SW- and C-Kopetdagh and Badkhyz [Fet & Kuznetsov, 1982; Nenilin, 1984a; Mikhailov & Fet, 1994; Wesolowska, 1996].

Description. MALE. Measurements. Carapace 2.24 long, 1.68 wide, 1.00 high at PLE. Ocular area 0.85 long, 1.15 wide anteriorly and 1.25 wide posteriorly. Diameter of AME 0.35. Abdomen 2.75 long, 1.50 wide. Cheliceral length 1.00. Length of leg segments: leg I: 1.35 + 0.75 + 1.15 + 0.75 + 0.65; leg II: 1.25 + 0.65 + 0.70 + 0.60; leg III: 1.10 + 0.54 + 0.75 + 0.70 + 0.65; leg IV: 1.75 + 0.65 + 1.10 + 1.05 + 0.70. Leg spination. Leg I: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.2-1; Mt v.2-2ap. Leg II: Fm d.1-1-1; pr.1ap.; Tb pr.1-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr. and rt.1-1, v.2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1, pr.1ap.; Tb pr.1-1, rt.1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Coloration. Carapace dark brown, sparsely covered with white scales. Eye field black. Sternum, maxillae and labium brown. Abdomen grey, venter with a pair of

white spots in front of spinnerets. Legs brown with lateral lines of white scales. Palpal structure as in Figs 132-136.

FEMALE. Measurements. Carapace 2.50 long, 1.94 wide, 1.00 high at PLE. Ocular area 0.90 long, 1.25 wide anteriorly and 1.50 wide posteriorly. Diameter of AME 0.35. Abdomen 4.00 long, 3.00 wide. Cheliceral length 0.85. Length of leg segments: leg I: 1.25 + 0.70 + 0.42 + 0.75 + 0.65; leg II: 1.00 + 0.70 + 0.75 + 0.70 + 0.60; leg III: 1.25 + 0.65 + 0.67 + 0.85 + 0.75; leg IV: 1.55 + 0.75 + 1.25 + 1.25 + 0.75. Leg spination. Leg I: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.2-2; Mt v.2-2. Leg II: Fm d.1-1-1, pr.1ap.; Tb pr.1-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr. and rt.1-1, v.1ap.; Mt d.1-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1; Tb pr. and rt.1-1, v.1-2ap.; Mt d.1-2ap., pr. and rt.1ap., v.2ap. Coloration as in ♂ but lighter. Epigyne and spermathecae as in Figs 30, 55-56.

Heliophanus verus Wesolowska, 1986

Figs 114, 109-112, 137-139.

H. v. Wesolowska, 1986: 223, fig. 789-792, 892.

H. ignorabilis Wesolowska, 1986: 214, figs 664-665 (in part, ♀ holotype only), **syn.n.**

Material. AZERBAIJAN: 8 ♀♀ (ISE), Lenkoran, Hyrcan Reserve, 20.06.1986, P.D.; 3 ♂♂, 2 ♀♀ (ISE), same locality, 18.06.1983, D.L.

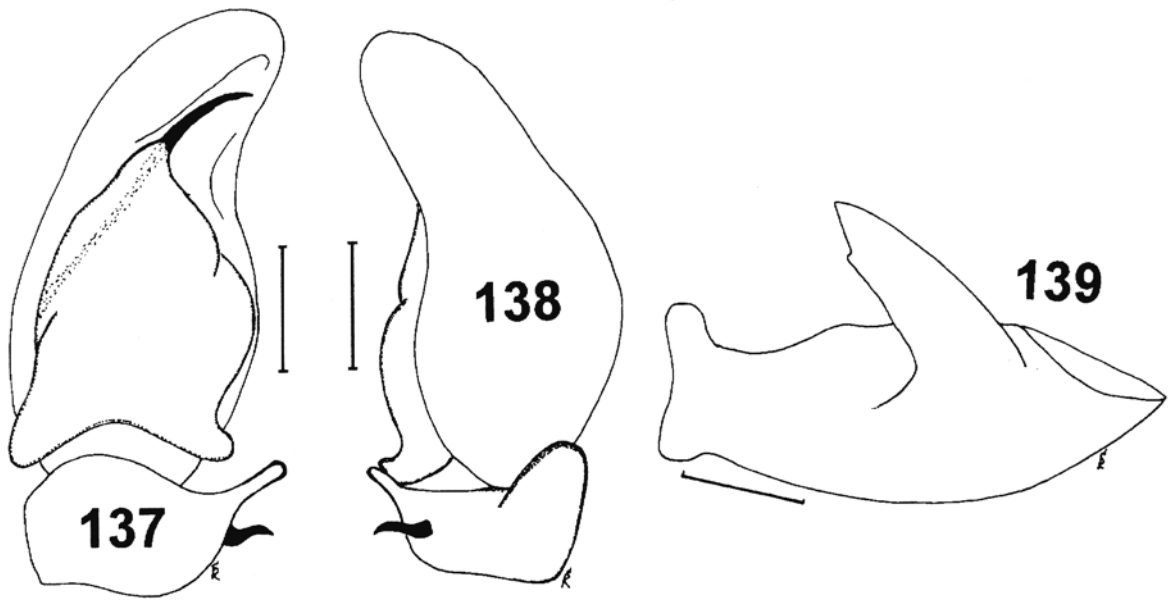
Diagnosis. *H. verus* is closest to *H. mordax*. The ♀ can be only poorly separated by the structure of the spermathecae (Figs 110-111) and body coloration. The ♂ differs in the structure of the tibial apophysis and femoral process (cf. Figs 102-106 and 137-139).

Distribution. Azerbaijan (Lenkoran) and Iran (Elburs) (Fig. 114).

Notes. According to Wesolowska's data [1986: 214, figs 664, 665], the holotype of *H. ignorabilis* Wesolowska, 1986, deriving from Iran (Elburs: Mazandaran), seems to actually represent a ♀ of *H. verus* (cf. Figs 109-111). Thus, *H. ignorabilis* should be considered as a junior synonym of *H. verus* rather than of *H. mordax*, as it has been stated recently by Wesolowska [1996].

Description. MALE. Measurements. Carapace 1.75 long, 1.25 wide, 0.75 high at PLE. Ocular area 0.60 long, 0.90 wide anteriorly and 1.00 wide posteriorly. Diameter of AME 0.35. Abdomen 1.75 long, 1.00 wide. Cheliceral length 0.50. Length of leg segments: leg I: 0.66 + 0.42 + 0.62 + 0.47 + 0.42; leg II: 0.62 + 0.38 + 0.50 + 0.38 + 0.45; leg III: 0.66 + 0.38 + 0.50 + 0.60 + 0.50; leg IV: 1.00 + 0.50 + 0.66 + 0.66 + 0.50. Leg spination. Leg I: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg II: Fm d.1-1-1; pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr. and rt.1ap.; Tb pr.1-1, rt.1-1-1, v.2ap.; Mt d.2ap., pr. and rt.1ap., v.2ap. Leg IV: Fm d.1-1-1, pr. and rt.1ap.; Tb pr. and rt.1-1, v.1-2ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Coloration. Carapace dark brown. Eye field black. Sternum and chelicerae dark brown. Maxillae brown. Labium black. Abdomen grey. Legs brown with dorsal longitudinal lines, but tarsi and metatarsi yellow. Palpal structure as in Figs 137-139.

FEMALE. Measurements. Carapace 2.25 long, 1.65 wide, 1.00 high at PLE. Ocular area 0.75 long, 1.25 wide anteriorly and 1.30 wide posteriorly. Diameter of AME 0.35. Abdomen 3.75 long, 2.35 wide. Cheliceral length 0.65. Length of leg segments: leg I: 1.00 + 0.62 + 0.67 + 0.62 + 0.50; leg II: 0.87 + 0.55 + 0.66 + 0.50 + 0.62; leg III: 1.13 + 0.50 + 0.62 + 0.66 + 0.62; leg IV: 1.38 + 0.62



Figs 137-139. *Heliophanus verus* Wesolowska, 1986: 137 — ♂ palp, ventral view; 138 — ditto, lateral view; 139 — palpal femur, lateral view. Scale: 0.14 mm.

Рис. 137-139. *Heliophanus verus* Wesolowska, 1986: 137 — палепа ♂, вентрально; 138 — то же, латерально; 139 — бедро пальпы, латерально. Масштаб: 0,14 мм.

+ 1.00 + 1.13 + 0.62. Leg spination. Leg I: Fm d.1-1-1; Tb v.2-2; Mt v.2-2ap. Leg II: Fm d.1-1-1; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr.1-1, rt.1-1-1, v.1-1ap.; Mt d.2-2ap., pr. and rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1; Tb pr.1-1, rt.1-1-1, v.1-2ap.; Mt d.1-2-2ap., pr. and rt.1ap., v.1-2ap. Coloration as in ♂ but lighter. Legs yellow. Epigyne and spermathecae as in Figs 109-111.

Heliophanus wesolowskiae sp.n.

Figs 140-145.

Material. Holotype: 1 ♂ (ISE), KYRGHYZSTAN, Chon-Kurchak, 7.07.1986, S.O.; 1 ♀ (ISE), Zaalaiskii Mt. Range, 20 km W of Daraut-Kurgan, 9.07.1995, S.O.

Paratypes: KYRGHYZSTAN: 1 ♀ (ISE), together with holotype; 1 ♀ (ZMMU), E of Lake Issyk-Kul, Taldysu, 7.07.1995, S.O. — KAZAKHSTAN: 1 ♀ (ZMMU), Zailiiskii Alatau Mt. Range, Canyon Asy, 6.07.1993, S.O.

Diagnosis. The ♂ of *H. wesolowskiae* is closest to that of *H. cupreus*, but it can be separated by the longer tibial apophysis, shorter embolus, and shape of the tegulum (cf. Figs 22-23 and 140-141). At the same time, the ♀ displays easily distinguishable genitalia, i.e. the epigynal plate is visibly jutting out of the epigastric furrow (Figs 144-145).

Distribution. E-Kazakhstan and Kyrgyzstan (Fig. 75).

Description. MALE. Carapace 2.50 long, 1.55 wide and 1.00 high at PLE. Abdomen 2.04 long, 1.50 wide. Cheliceral length 0.75. Ocular area 0.75 long, 1.13 wide anteriorly and 1.00 wide posteriorly. Diameter of AME 0.38. Length of leg segments: leg I: 1.00 + 0.58 + 0.75 + 0.50 + 0.58; leg II: 0.87 + 0.45 + 0.60 + 0.50 + 0.50; leg III: 1.00 + 0.50 + 0.55 + 0.67 + 0.50; leg IV: 1.12 + 0.50 + 1.00 + 1.00 + 0.62. Leg spination. Leg I: Fm d.1-1-1, pr.1ap.; Tb v.1-1; Mt v.2-2ap. Leg II: Fm d.1-1-1, pr.1ap.; Tb v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, rt.1-1-1, v.2ap.; Mt d.2ap., pr. and

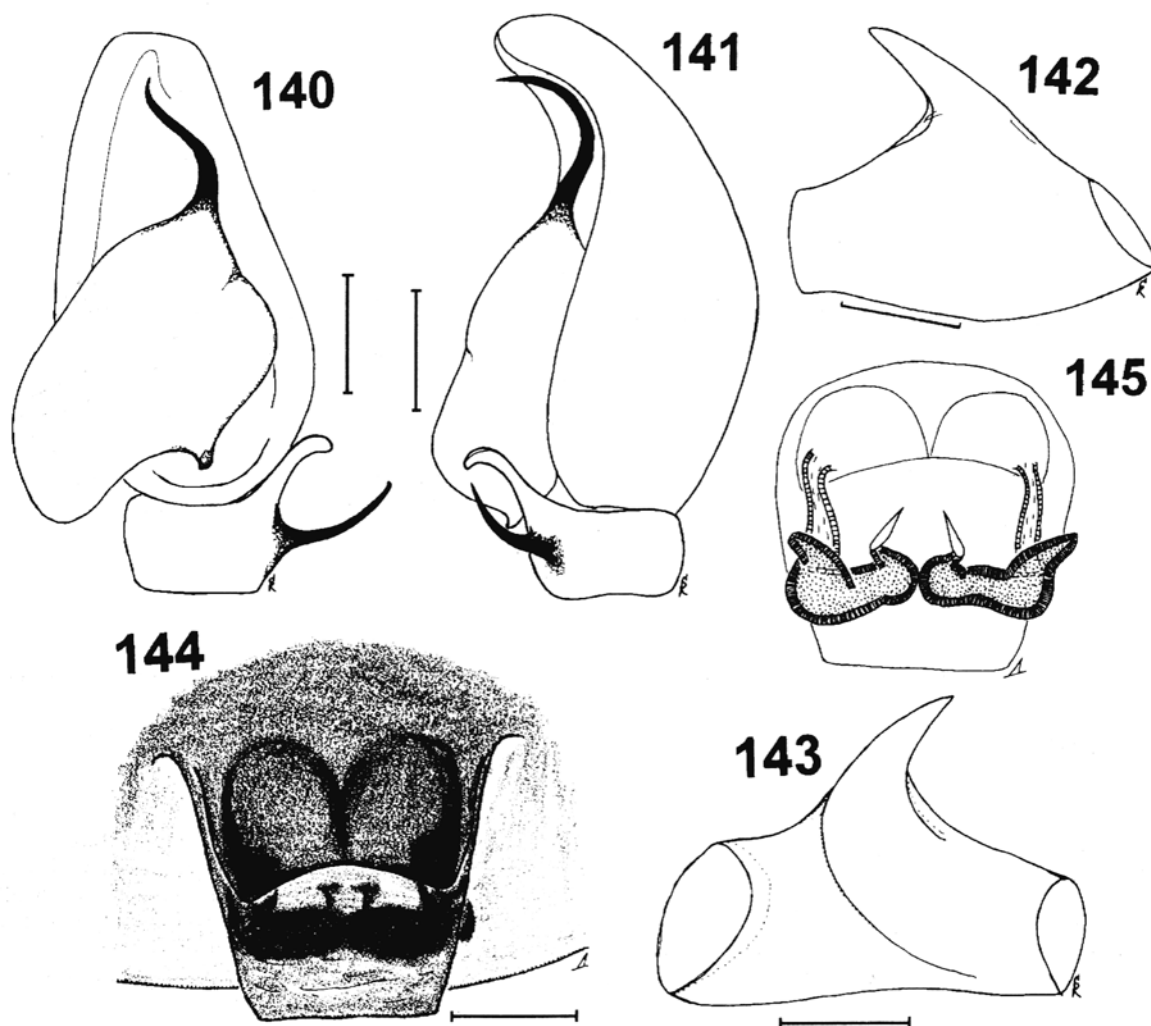
rt.1ap., v.1-2ap. Leg IV: Fm d.1-1-1, pr.1ap.; Tb pr. and rt.1-1-1, v.1-1ap.; Mt d.2-2ap., pr. and rt.1ap., v.2ap. Coloration. Carapace dark brown, eye field with light spots. Abdomen grey. Dorsum with a small group of white hairs anteriorly. Venter without colour marking. Legs light brown. Palpal structure as in Figs 14-143.

FEMALE. Carapace 2.00 long, 1.38 wide and 1.00 high at PLE. Abdomen 5.63 long, 3.00 wide. Cheliceral length 0.75. Ocular area 0.75 long, 1.12 wide anteriorly and 1.25 wide posteriorly. Diameter of AME 0.30. Length of leg segments: leg I: 1.07 + 0.62 + 0.70 + 0.62 + 0.58; leg II: 1.00 + 0.55 + 0.60 + 0.50 + 0.50; leg III: 1.13 + 0.58 + 0.62 + 0.67 + 0.62; leg IV: 1.50 + 0.62 + 1.00 + 1.00 + 0.65. Leg spination. Leg I: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, v.1-1; Mt v.2-2ap. Leg II: Fm d.1-1-1, pr.1ap.; Tb v.1-1; Mt v.2-2ap. Leg III: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, rt.1-1, v.1ap.; Mt d.1-2ap, pr.1-1ap., v.2ap. Leg IV: Fm d.1-1-1, pr.1ap.; Tb pr.0-1, rt.1-1, v.1-1; Mt d.0-1-0, v.0-1-0, 6ap. Coloration. Carapace dark brown, bordered by a grey band. Eye field black. Maxillae and labium brown with yellow tips. Sternum grey. Abdomen: Dorsum grey, covered with white hairs anteriorly and laterally; venter with a pair of white spots in front of spinnerets. Legs yellow. Coxae with dorsal grey patches. Femora and tibiae with lateral, dark brown, longitudinal lines, with apical ends being dark brown too. Epigyne and spermathecae as in Figs 144-145.

Name. Honours the well-known Polish arachnologist, Dr. W. Wesolowska, the author of a very useful world-wide revision of *Heliophanus* that has strongly facilitated the current study.

Doubtful and erroneous records

1. *Heliophanus aeneus* (Hahn, 1831). Repeatedly



Figs 140-145. *Heliophanus wesolowskiae* sp.n.: 140 — ♂ palp, ventral view; 141 — ditto, lateral view; 142 — palpal femur, lateral view; 143 — ditto, median view; 144 — epigyne; 145 — spermathecae, dorsal view. Scales: 0.14 (140-143) & 0.1 mm (144-145).

Рис. 140-145. *Heliophanus wesolowskiae* sp.n.: 140 — палепа ♂, вентрально; 141 — то же, латерально; 142 — бедро палепы, латерально; 143 — то же, медиально; 144 — эпигина; 145 — сперматека, вид дорзально. Масштаб: 0,14 (140-143) и 0,1 мм (144-145).

reported from Middle Asia [Kroneberg, 1875; Spassky & Shnitnikov, 1937; Andreeva, 1975, 1976; Zonshteyn, 1984; Gafarov, 1987]. However, we have been unable to spot this species among the vast *Heliophanus* materials (re-) examined during the current study. Thus, we assume these authors might have actually dealt either with *H. auratus* (♂) or with *H. potanini* (♀).

2. *Heliophanus melinus* L. Koch, 1867. All records of this species in the Caucasus [Minoranskii et al., 1984] and Middle Asia, e.g. by Simon [1899], Nenilin [1984a, 1985] and Fet [1983], seem to belong either to *H. patagiatus* or to *H. dubius*.

3. *Heliophanus minutissimus* Simon, 1871. Reported from the Caucasus by Nenilin [1985]. However, this species was described by Simon based on juveniles deriving from the Crimean Peninsula (instead of the Caucasus, as stated by Nenilin [1985]). The species should be considered as **nomen dubium** [s. Wesolowska, 1986: 232].

4. *Heliophanus niveivestis* Simon, 1889. This species

is considered as a **nomen dubium** [s. Wesolowska, 1986; 1996].

5. *Heliophanus rufithorax* Simon, 1868. All records in Middle Asia by Kroneberg [1875], Kharitonov [1932] and Nenilin [1984a, 1985] require confirmation upon pertinent material [s. Wesolowska, 1996].

6. *Heliophanus simplex* Simon, 1868. Reported by Savlieva [1970; 1979] from E-Kazakhstan. Yet most probably this record belongs either to *H. dubius* or to *H. patagiatus*, as *H. simplex* is restricted to the southern regions of C-Europe only [Wesolowska, 1986: fig. 899]. *H. simplex* was also reported from Azerbaijan [Dunin & Mamedov, 1992] and Chechnya [Minoranskii et al., 1984], but beyond any doubt, these authors actually dealt with *H. equester* (♀) (Dunin's material re-examined!). The occurrence of *H. simplex* in E-Kazakhstan and/or the Caucasus thus requires confirmation upon pertinent material.

7. *Heliophanus tribulosus* Simon, 1868. Recorded from the Almaty Area by Spassky & Shnitnikov [1937: as *H. cambridgei*], Tarabaev [1979] and Prószyński [1979:

figs 117-118], the latter author after having restudied the ♀ referred to by Spassky & Shnitnikov. A new re-examination of Spassky's original specimen leaves no doubt, these authors actually dealt with a ♀ of *H. potanini*. On the other hand, *H. tribulosus* is known to be restricted to S-Europe only and displays such an extremely peculiar structure of the genitalia [Wesołowska, 1986: figs 492-502, 898] that it prevents possible misidentifications. *H. tribulosus* has been reported also from the Caucasus [Dunin & Mamedov, 1992]. However, among the Caucasian salticids handed to us by Dr. P.M. Dunin, we have found no *H. tribulosus*. The only vial containing a ♀ previously determined by Dunin as *H. tribulosus* appears to belong in fact to *H. mordax*. Hence the occurrence of *H. tribulosus* in the Caucasus requires confirmation upon pertinent material.

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